



An ATARI™ Users Magazine

75p

TeleCommunicate!

ISSUE 6

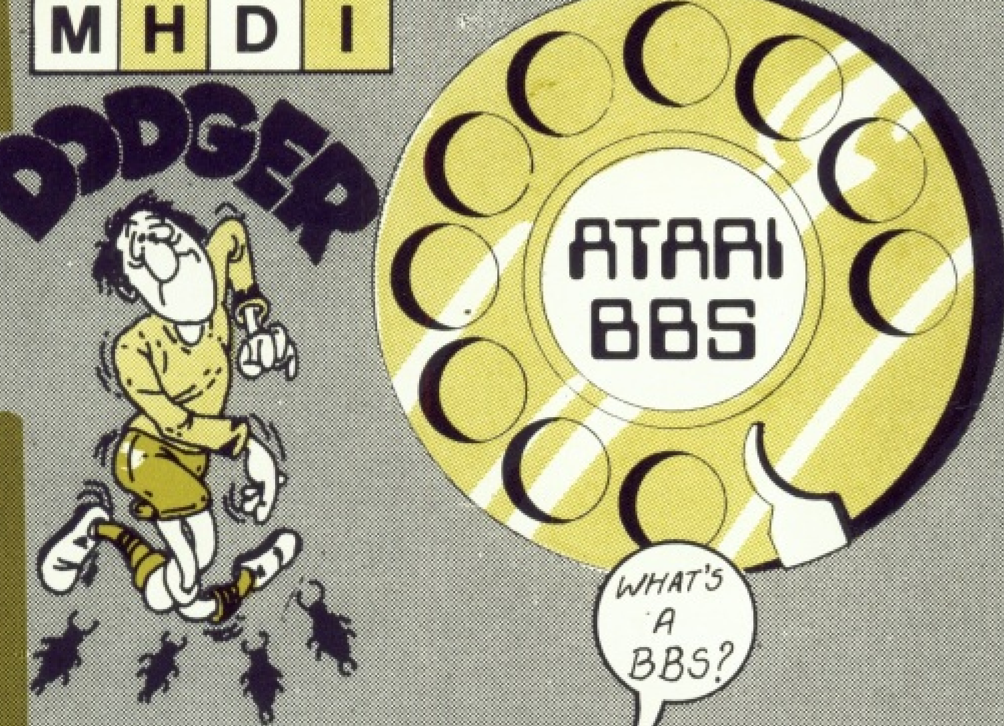


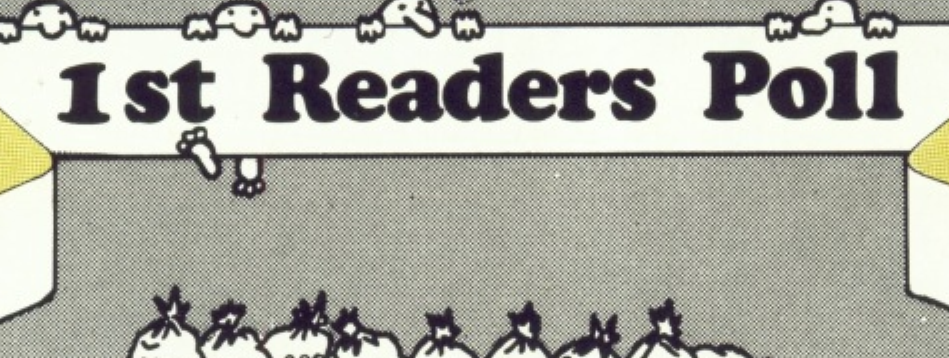


Time for Music

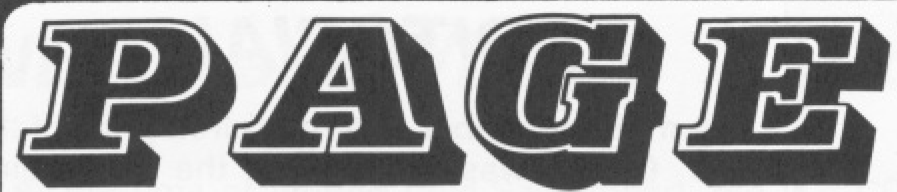
Lots of reviews

PLUS
all the regular features










An ATARI™ Users Magazine

CONTENTS ISSUE 6 NOVEMBER/DECEMBER 1983

SEE PAGE 29 FOR LISTING CONVENTIONS



Editor: Les Ellingham

Office: 18, Underwood Close, Parkside, Stafford

Editorial/Advertising: 0785 41153

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PAGE 6 is a Users magazine and relies entirely on readers' support in submitting articles and programs. The aim is to explore Atari computing through the exchange of information and knowledge and we cannot, unfortunately, pay for articles published. We hope you will gain satisfaction from seeing your work published and in turn we hope you will learn from articles submitted by other readers.

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EDITORIAL

In mid-September, the rumoured price of the new 600XL was £139 with the 400 being reduced to £99.95. With a new series of machines in up to the minute styling and with still the top specification, Atari surely can't go wrong and the long awaited mass acceptance of Atari will come at last. Or will it? There is no doubt that the Atari machines represent excellent value for money, but let's be honest, the software—from nearly all sources—is vastly overpriced.

If you did not already know how good the Atari was, would you buy one? Look through the software price lists and you will see that most of the software for the Atari is around £25 and above. Now let's suppose that you buy an average of one program a month—not unreasonable for most owners—and your total outlay over one year, if you buy a 600XL and cassette player will be around £500. What else could you buy instead? A BBC and 12 programs with £80 change, a Dragon with 12 programs and £230 change or a Vic-20 and 12 programs and £250 change!

There is no denying that the Atari is the best home computer and the best Atari software is unbeatable, but let's not kid ourselves, not all of the high-priced software is of the highest quality and much of it can be emulated by the other machines. The support that Atari gets on the software side amongst retailers (other than the specialists) is pitiful and the reason is that your local camera-cum-computer shop does not want £20-£30 programs tied up in stock. Why should he when he can stock and sell four times as much Spectrum software?

Who then is going to take the step? One or two English software producers have reduced some of their prices and more will follow but overall the prices remain high. Will Atari take the lead? Or the independent importers?

You know that you bought the best machine, isn't it a pity that you can't afford the best software?

BACK ISSUES

Issue 1 sold out.

Issues 2 & 3 70p. each inc. p. & p.

Issues 4 & 5 £1.00 each inc. p. & p.

NEWS and VIEWS

At the time of writing (mid-September), the stock position of the new range of machines and peripherals in the U.S. was far from promising. The 600XL, originally scheduled for August was due at the end of September with the 800XL now due in mid-October. The 1400XL is now scheduled for mid-November whilst the 1450XLD is due in early December. The 1050 disk drives were shipped in August but were promptly put on production hold due to an inability to read some third party software. The letter quality printer, the 1027, was due at the end of September. Let us hope that similar delays do not occur in the U.K. I understand from several retailers that sales of the 400 and 800 machines have slumped drastically since the new machines were announced, which brings us to . . .

The 400, 800 and 810 Disk Drive have all been discontinued in the U.S. and the only significant stocks are of 800's which can be had for about $200 after a promotional rebate. The 850 interface is being continued but they are few and far between. Meanwhile in the U.K. some real bargains could be found for 400's and 800's as early as late August. Shop around and you might get a 400 for less than a Spectrum!

Gemini Electronics in Manchester have recently closed their retail shop but will continue to give a Mail Order service for Atari users. This move has been made in order to expand The English Software Company, already Britain's largest producer of software for the Atari. Several new titles were announced some time ago and should be in the shops by now but English Software plan to add to their range and include educational titles. Already in the pipeline is a series of language cassettes for French, German, Italian and Spanish written by Dr. Michael M. Gruneberg of University College, Swansea.

At last a full series of 'serious' software has been announced by Synapse. These include **SYN-TEXT, SYN-FILE +, SYN-TREND, SYN-CALC, SYN-STOCK, SYN-COMM, SYN-STAT, SYN-TAX** and **SYN-MAIL**. Whilst some of these titles will not be suitable for British use, it is pleasing to find that the range of business software is at last expanding. ●

Contact

CONTACT is here for you to use if you want to, but there has been very little response since the last issue. If you have any specific problem with some software that you think others could help you on, or you just want to get in touch with other owners, drop CONTACT a line.

Liz Ahmedzai has come to a grinding halt on Ulysses and The Golden Fleece having sailed past the sirens, killed the cyclops and freed a man from a cage. If you know what to do next, drop Liz a line to 37, Birch Drive, Lordswood, Chatham, Kent.

Are you a ZORK fanatic? You probably had details of the Zork Users Group when you bought your program but they are based in the U.S. Did you know that you can get the InvisiClues and Maps in the U.K.? They are available from GB Microland of 7, Queens Parade, London Road, Waterlooville, Hants. Drop them a line or ring them on 07014 59911 for details. Stuart Garrett there also tells me that Zork IV, V and VI will be available very soon! ●

INPUT

Dear Les,

Congratulations on another good issue. In fact so good that I am enclosing my subscription for the next six issues.

Grab an Apple is one of the best magazine programs that I have found published anywhere, it is short and sweet. Having said that, I now offer some small improvements which I find make it even more playable.

```
220 HX=HX+DX:HY=HY+DY:LOCATE HX,HY,
Z:SOUND 0,100,12,4:SOUND 1,COUNT*4,
10,4
225 COLOR 161:PLOT BX,BY:COLOR HEAD
:PLOT HX,HY:SOUND 0,0,0,0:SOUND 1,0
,0,0
235 W=51:IF STRIG(0)=0 THEN W=SPEED
+1:COUNT=COUNT+1
240 COUNT=COUNT-1:IF COUNT THEN FOR
 I=1 TO W-SPEED:NEXT I:GOTO 170
```

These modifications add on an extra sound to let you know that your time is running out (lines 220,225) and give you the opportunity to speed up the caterpillar by pressing the fire button, gaining extra points and improving the early stages of the game (lines 235,240).

Mike Spires,
Evesham

□ □ □ □ □ □ □ □ □ □ □

Dear Les,

I am very pleased with PAGE 6 but I was wondering if you had any plans for articles on how to use Atari computers for other purposes. I am interested in amateur electronics and every month see D-I-Y interface boards for other computers but never Atari. Any information on this subject would be of interest to me and I am sure to many other users as well. I have never even seen any information on the 850 interface but at over £100 it does not seem good value when compared with D-I-Y projects for other computers which can be made for about £15. Even the Input/Output ports on the Atari seem to be a secret. Can any of your readers tell me what the pins are on each port or where I can find the information?

M. J. Orme,
Burton-on-Trent

***I would be happy to feature articles on hardware projects but rely on readers to send in articles. One or two people have promised articles of this nature and as soon as they are received you will see them. Among the projects which other users have built are a speech synthesiser for £25, a rapid-fire joystick trigger, an infra-red burglar alarm and various modems including a hook-up to Micronet. If any of these people wish to share their discoveries they are free to do so in the pages of PAGE 6. I don't understand the hardware side of things, but it is exciting to hear some of the projects others have designed or built.—Ed.*

Dear Sir,

Having got stuck on Adventures, I have often wanted to PEEK memory to get some clues but the Reset on the Atari does not enable you to get back to Basic to write the program.

For those with a Disk Drive, the solution is so simple that I wondered why I hadn't thought of it before. Simply choose selection C of DOS and print the program to the screen, e.g. PYRAMID,E:. Then using CTRL-1 you can stop the listing where you want to.

David Blease,
Weymouth

***That's cheating, isn't it?—Ed.*

□ □ □ □ □ □ □ □ □ □ □

Dear Sirs,

I am much impressed by Tiny Text in issue 2. Your readers might like to add the following lines I have included because I required an underlined title. This is for use with an Epson printer.

The Control Codes included are:

CTRL-U underline following text

CTRL-O turn underline off

```
115 TRAP 120:OPEN #1,8,0,"P:"
729 IF B=21 AND OP=3 THEN ? #1;"[ES
C,ESC,MINUS,CTRL-A"
730 IF B=15 AND OP=3 THEN ? #1;"[ES
C,ESC,MINUS,CTRL-COMMA]"
830 IF OP=3 THEN ? #1;SP$(1,SP);A$
```

Finally, change LPRINT to ? #1 in lines 725,727 and 815.

Without changing the program further, it is only possible to underline all text on a line.

George Greenway,
Sutton Coldfield

Lea Valley User Group

What do User Groups do? Here is a report received from Matthew Tydeman of Lea Valley Atari Users Group.

" Most of our meetings are held at a church hall in Wormley which is big enough for all of our members with four machines set up and running for members to watch until the evening's talk begins. Talks are mostly on Graphics as this seems to be an area that most members are interested in. One of our members will be presenting talks beginning with the word COLOR and, hopefully, working up to machine language. When the talk is finished members are free to look at the screens behind them which are running a variety of games, demos, etc. Many members get the opportunity to see programs they would not otherwise be able to review. Members bring along newly purchased items of software and hardware for the next meeting so that there is always something new to see. We also have a magazine library and a book library."

If you would like more details of where and when the Club meets, send a stamped addressed envelope to Matthew Tydeman, 125, Cadmore Lane, Cheshunt, Herts. The Group have also, by the way, produced a poster advertising the Group which is quite superb. Well done.

FOR SALE

Harvey Kong Tin, who has written some fine reviews for PAGE 6, has now returned home to New Zealand but has left behind some game cartridges which you can snap up for the bargain price of only £18.00 each.

CENTIPEDE, MISSILE COMMAND, K-STAR PATROL, K-RAZY SHOOTOUT, SUBMARINE COMMANDER, PAC-MAN and ZAXXON.

All are on ROM except Zaxxon which is cassette. All are as new with original instructions and packaging. All normally retail at around £30.00, so here's a chance to save yourself some money—if you're quick. First come, first served.

If you are interested contact W. H. Staff, 46, Cambeak Close, Bransholm, Hull. Tel.: 0482 834259.

Memories . . .

Mark Hutchinson, Belfast

When it comes to writing your own programs, a lot more can be done by using POKE statements than can be achieved using Basic. POKEs can save memory, enable you to write faster and let your programs run a bit faster. Following this introduction there is a list of locations that you can experiment with, many of which are not in the Basic Reference Manual. The experts amongst us can skip the introduction and look at the list to see if they can spot any new ones. I make no apologies if you do not, this article is mainly to help beginners.

What exactly is a memory location? It is the numeric position of a Register—a piece of hardware, that holds a bit (no pun intended) of information. Your Atari is what is termed an eight-bit machine which means that each register can hold eight bits (0 to 7) of information stored in BINARY (0 or 1). As all mathematical geniuses know, this is equal to 2 to the power of 8, or 256. This collection of bits is known as a BYTE and each Byte can hold a number up to 255 (0 is included). Now the

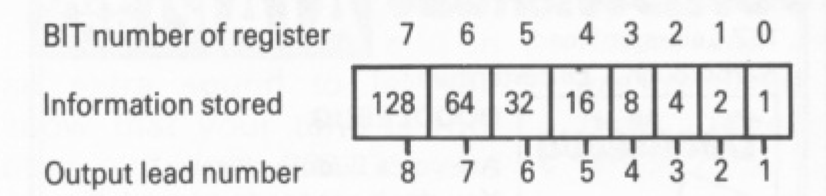


FIGURE 1

complications. A register can be used as a switch or a store. As a store it will hold information in the form 0 to 255, 0 being used for the empty or switch off state. As a switch, you will need to know the output lead that you want to switch. Binary is a representation of decimal numbers in the form 0 or 1 (termed BINARY CODED DECIMAL). This representation starts at 1. The next number is 1*2, or 2, and the next is 2*2, or 4, and so on up to 128. If you look at figure 1, you will see a register with eight leads (1 to 8). If you wish to turn on output 8, you need to make the register hold 128. This is done by POKEing [Register No],128. Similarly, if you wish to turn output 8 off then POKE with 0. You can turn any of the other outputs on by POKEing with the appropriate number but what do you do if you want to turn more than one lead on? Simple, you add together the numbers of the leads you want on. For instance to turn on leads 4 and 6 POKE with 80. Try the short program listing to see how numbers affect the byte.

Why is lead 1 in figure 1 equal to BIT 0? Well, mathematically, the number stored is equal to 2 to the power of the bit. Any number to the power of 0 is equal to 1 incidentally.

Let's now take a quick look at appendix I of the Basic Manual. In some instances, a number

```
0 REM ******************************
1 REM *    BINARY REPRESENTATION     *
2 REM *       by Les Ellingham       *
3 REM ******************************
4 REM NOTE INVERSE SPACES IN LINES 30
     and 45
5 DIM BIN$(17),SP$(20)
6 BIN$="| | | | | | | | | ":REM SHIFT
EQUALS
7 SP$="                    ":REM 20 SP
ACES
8 ? CHR$(125):GOSUB 100
10 POKE 752,0:A=2:POSITION 13,16:? "NU
MBER    [ESC,LEFT][ESC,LEFT][ESC,LEFT]
[ESC,LEFT]";:INPUT NUM:IF NUM>255 OR N
UM<0 THEN 10
15 POKE 752,1:POKE 82,13:POKE 84,3:? :
? SP$;"[ESC,UP]"
20 FOR N=7 TO 0 STEP -1:BIN=2^N
30 IF INT(NUM/BIN)=1 THEN BIN$(A,A)="_
":NUM=NUM-BIN:GOTO 45
40 BIN$(A,A)=" "
45 IF BIN$(A,A)="_" THEN ? INT(BIN+0.0
5);:? "+";
50 A=A+2:NEXT N:IF NUM>0 THEN ? "
[ESC,LEFT] ":REM Left arrow/space
55 POKE 84,0:POKE 82,0
60 POSITION 13,11:? BIN$
70 GOTO 10
100 POSITION 2,3:? "MAKE-UP":? "OF NUM
BER"
110 POSITION 13,10:? "[Q][R][W][R]
[W][R][W][R][W][R][W][R][W][R]
[W][R][E]"
120 POSITION 2,11:? "ON/OFF     | | |
| | | | | |"
130 POSITION 13,12:? "[Z][R][X][R]
[X][R][X][R][X][R][X][R][X][R]
[X][R][C]"
140 POSITION 2,9:? "BIT NUMBER  7 6 5
4 3 2 1 0"
170 RETURN
```

. . . are made of this

greater than 255 needs to be stored and this is done by assigning two memory locations. The first location (LEAST SIGNIFICANT BYTE) will hold a number from 0 to 255 and when 256 is reached, the second location (MOST SIGNIFICANT BYTE) holds 1 and the first location returns to 0. How do you find out what is stored? Easy.

NUMBER STORED=1st LOCATION+2nd LOCATION *256

Right, that's enough of the introductions, let's get down to some real locations to PEEK and POKE

16 POKE 16,64 to disable BREAK key. Complete keyboard disable is 0. Normal is 192. POKE these numbers into 53774 as well.

65 Input/Output noise flag. Tired of listening to the noise of all those bytes being transferred? Then POKE 65,0.

87 Graphics Mode register. Try 10 GR.18:POKE 87,0 followed by RUN and LIST. The number you poke here refers to the Graphics mode required. It does however depend on DISPLAY LIST pointers and POSITION statements to operate it properly.

106 This location gives the top of RAM in pages. By reducing this amount you can store anything above the new RAMTOP. Basic won't know it's there unless you tell it.

559 Use P=PEEK(559):POKE 559,0 to turn off the screen. POKE 559,P to switch it back on again. This is really Direct Memory Access Control (DMACTL) and is used in PM Graphics. The screen can draw up to 30% faster with the display off.

580 One of the nasties used to protect programs. When you power up, everything in memory is cleared. This is called COLDSTART. Hitting SYSTEM RESET is called WARMSTART and keeps everything in RAM. POKE 580,1 turns SYSTEM RESET into COLDSTART and when you press SYSTEM RESET, goodbye program. Normal is 0.

632-635 Instead of using S=STICK(0), try PEEKing 632-635 for STICK(0-3).

644-647 Try the same for STRIG(0-3).

656 Text window cursor. POKE with 0 to 3 for placing text on a row.

657 Text window cursor. POKE with 0 to 39 for placing text on a column. POSITION statements relate only to the upper area and not the text window.

842 Lets you write lines into a program without stopping, e.g. 10 POKE 842,13:POS.2,13:? "100 SE.2,2,2":? "CONT":POS.0,0:STOP: POKE 842,12. Now RUN it and LIST it.

53279 Console switch register. 7=no key pressed. 3=OPTION. 5=SELECT. 6=START. 4=SELECT and START. 2=OPTION and START. 1=OPTION and SELECT. 0=all three pressed. Also controls keyboard speaker by POKEing with 0-7 e.g. 10 FOR P=1 TO 50:POKE 53279,0:FOR T=1 TO 40:NEXT T:NEXT P.

53770 Random number generator e.g. 10 ? INT(PEEK(53770)*100).

54273 Character control hardware register. Changes every 50th of a second. Use shadow location 755. Try this 10 POKE 54273,4:FOR T=1 TO 5:NEXT T:GOTO 10.

You may have noticed a couple of words above which are worth explaining further.

continued on page 15

TeleCommunicate!

Jonathon Sanders, SYSOP Atari SBBS

In the new film "WARGAMES", a young computer enthusiast links his home computer into one of the Pentagon computers and nearly precipitates a nuclear war. Now, you can do the same thing with your Atari! I am not going to tell you how to access the Pentagon, but explain how you can connect to the growing number of teleprocessing systems in this country which provide special support for Atari.

In the last few weeks, two separate "Bulletin Board Services" have been started up using Atari computers. By calling these BBS, Atari users can send and receive messages, get copies of programs in Basic and Machine Code,

```
10 REM ***SIMPLE DOWNLOAD PROGRAM ***
15 REM
20 REM RUN    -ENTERS TERMINAL MODE
30 REM START  -BEGIN DOWNLOAD
40 REM SELECT -SAVE DOWNLOADED TEXT
50 REM OPTION -DISCONNECT AND END
55 REM
60 REM ******************************
80 MEM=FRE(0)-100:DIM FILE$(15),DAT$(M
EM):DAT$(1)=" ":DAT$(MEM)=" ":DAT$(2)=
DAT$
90 OPEN #1,4,0,"K:"
100 TRANSLATION=0
110 DOWN=0:CLOSE #2:XIO 34,#2,192,0,"R
:":XIO 38,#2,TRANSLATION,0,"R:":OPEN #
2,13,0,"R:":XIO 40,#2,0,0,"R:"
120 SETCOLOR 2,7,4:? "TERMINAL..."
130 STATUS #2,S:IF PEEK(747) THEN GET
#2,S:? CHR$(S);:IF DOWN THEN POKE ADDR
,S:ADDR=ADDR+1:GOTO 130
140 IF PEEK(764)<255 THEN GET #1,S:PUT
 #2,S:GOTO 130
150 IF PEEK(53279)=7 THEN 130
160 IF PEEK(53279)=3 THEN CLOSE #2:XIO
 34,#2,160,0,"R:":? :? :? "DISCONNECTE
D...":? :END
170 IF PEEK(53279)=6 AND DOWN=0 THEN D
OWN=1:ADDR=ADR(DAT$):SETCOLOR 2,2,4:?
:? "DOWNLOAD MODE":GOTO 130
180 IF PEEK(53279)<>5 OR DOWN=0 THEN 1
30
190 CLOSE #2:? :? "SAVE TO DEVICE (C:
or D:FILENAME.EXT)":INPUT FILE$
200 TRAP 190:OPEN #2,8,0,FILE$:TRAP 23
0
210 FOR C=1 TO ADDR-ADR(DAT$)+1:S=ASC(
DAT$(C,C)):IF S<32 THEN NEXT C
220 PUT #2,S:NEXT C:GOTO 110
230 ? :? "BUFFER EMPTY":GOTO 110
```

buy and sell, and get several other services. These BBS are entirely free, you only have to pay for the phone call which at cheap rate costs 10p for 10 minutes for a local call, 25p for 10 minutes up to 35 miles, or 64p long distance (only 49p if you are on a 'Low Cost Route').

The hardware needed to start telecommunicating consists of a 'modem', an Atari 850 Interface module, and an RS232 interconnecting cable. If you have already purchased the 850 Interface to provide a parallel port for your printer, then the extra hardware will cost between £40 and £90. If you need to buy the Interface then it will cost a further £120.

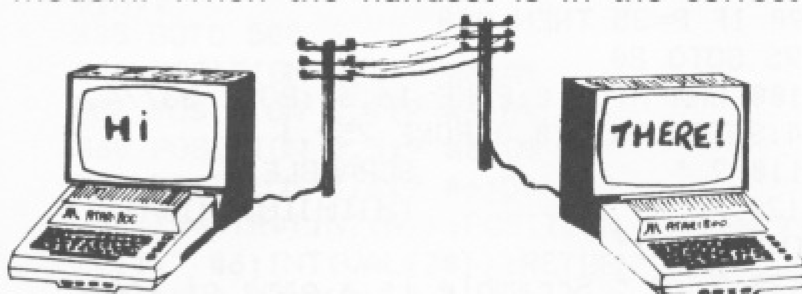
The Atari provides an RS232 standard outlet, enabling a Modem to be connected to your Atari. The modem is a device which converts electrical pulses representing bytes or characters in the computer into sound pulses which can be transmitted over the telephone line. The speed that these pulses are transmitted is measured in BAUD. The most common speed used between microcomputers is 300 Baud, which is about 30 characters a second.

There are two types of modem. 'Acoustic-coupled' modems have rubber cups which clip over the telephone earpiece and microphone, provided they are not the modern trimphone shape, whilst 'Direct-coupled' modems are connected directly to the telephone line via a jackplug installed by British Telecom. Direct-coupled modems should be a type approved by British Telecom. Modems are available from several suppliers and a short list is given at the end of this article.

You will also need appropriate software to enable you to send and receive messages and to "download programs" (i.e. get copies of programs over the phone and save to tape, disk or printer). There are many excellent commercial programs available, including TELETALK, TELETARI, T.H.E. as well as CHAMELEON from APX and TELELINK. These range from £15 to £45. For the beginner, however, there is an excellent public domain

program called JTERM, written by Frank C. Jones, published in COMPUTE! January 1983. If you cannot find that copy, a listing of an improved version of JTERM can be obtained by sending a large s.a.e. to GB MICROLAND, 7, QUEENS PARADE, WATERLOOVILLE, HANTS. If you should visit GB MICROLAND, you can get a copy already on diskette. Alternatively, you can "download" a free working copy of JTERM direct onto your own system from my Southern Bulletin Board Service (SBBS) by using the short program listing with this article.

To access a Bulletin Board, connect up your 850 Interface and Modem using the special RS232 cable. Turn on the 850 before you turn on the computer. If you have a disk system, then the DOS diskette must have a copy of the AUTORUN.SYS file supplied with Atari DOS 2.0S as this boots in the RS232 handler from the 850 as explained in the 850 manual. The modem should be set to 'call' and 'full duplex' modes. Load the terminal program, phone the BBS number and when you hear the high-pitched answer tone, RUN your program. This will activate your direct connect modem. If you have an acoustic modem, quickly place the telephone handset into the rubber cups on the modem. When the handset is in the correct position, a light is lit indicating that the modem is receiving the high-pitched tone. Now press RETURN a couple of times and you should be communicating . . . . follow the instructions given by the BBS.



That's all you need to know to start telecommunicating. If you have any difficulties, call the BBS outside the regular hours and discuss your problem with the System Operator, he should be able to help. Good luck!

MODEM SUPPLIERS

ACOUSTIC COUPLED:
AMBIT, 200, North Service Road, Brentwood, Essex CM14 4SG (DIY kit).
MINOR MIRACLES, P.O. Box 48, Ipswich IP4 2AB.
TANDY SHOPS

DIRECT COUPLED:
MAPLINS, P.O. Box 3, Rayleigh, Essex SS5 8LR (DIY kit).
DISPLAY ELECTRONICS, 32 Biggin Way, Upper Norwood, London SE19 3XF.
MINOR MIRACLES, P.O. Box 48, Ipswich IP4 2AB.

ATARI BULLETIN BOARDS

SBBS—Chichester—0243 511077 running every night from 21.00 to 02.00.
SYSOP: Jonathon Sanders.
ECABS—Chippenham—0249 657744 running every night.
SYSOP: Matthew Jones.
Another Atari BBS is expected shortly.

Other BBS which have special Atari message sections:
TBBS—London—01 348 9400.
SYSOP: John Nolan.
MAILBOX 80—Liverpool—051 428 8924.
SYSOP: Peter Toothill.
MAPLIN—Southend—0702 552941.

There are, in addition, many other general BBS in the U.K., details of which can be found on any of the above BBS. ●

✪ THE TOP TEN ✪

1	**A.C.E.**	English Software Co.	16K C
2	**ARCADE MACHINE**	Broderbrund	48K D
3	**SUSPENDED**	Infocom	32K D
4	**ZAXXON**	Datasoft	16K C
5	**BLUE MAX**	Synapse	32K C
6	**PLANETFALL**	Infocom	32K D
7	**MAGIC WINDOW**	Quicksilva	16K C
8	**DARK CRYSTAL**	Sierra On-Line	48K D
9	**HOME FINANCIAL MANAGEMENT**	Thorn EMI	16K C
10	**EASTERN FRONT**	Atari	16K ROM

This chart represents sales up to 23/9/83

Figures supplied by
The Atari Center 021 643 9100

Scramble

Steve Hutton, West Midlands

Scramble contains instructions for play in the listing and is a fairly simple game of logic that nevertheless is quite challenging. To see if you can improve, or to challenge an opponent, there is a counter on the bottom right of the screen. The best time is transferred to the bottom left and will be updated until System Reset is pressed.

The program is interesting in that it uses Inverse characters in Graphics 2, something which you cannot normally get. This is achieved by transferring the character set to RAM and redefining the characters in lines 200-260. Rather than writing data for each of the characters, the Inverse is achieved by POKEing the difference between 255 and the data of the original character at the time the characters are transferred. Some characters cause problems due to the fact that they do not have 'borders' and these need to be specially defined. The letter 'M' is a case in point and is redefined in line 250 with Data from line 260. Try this technique in your own programs, the result is quite pleasing and gives much more impact.

A WORD OF WARNING. The program contains a routine which re-runs the program on System Reset (courtesy of Norwich User Group) and the Break key is disabled. **SAVE A COPY OF THE LISTING BEFORE YOU RUN IT**. If you don't, there is no way to LIST the program once it has been RUN. If you use TYPO to check the listing, the table given is for the listing as printed and TYPO should be used before the program is first RUN. If you wish to check the listing otherwise, it is suggested that line 6 is deleted and then reinstated once the program is running correctly.


```
1 REM ******************************
2 REM *          SCRAMBLE          *
3 REM *       BY STEVE HUTTON      *
4 REM *          6/8/83            *
5 REM ******************************
6 POKE 2,64:POKE 3,185:POKE 9,2:TRAP 1
000
7 DIM A$(4),B$(4),C$(4),D$(4),T$(1),Z$
(6):HI=99999
10 ? CHR$(125):POKE 752,1
15 GRAPHICS 2+16:POKE 16,64:POKE 53774
,64:SETCOLOR 2,0,0
20 DL=PEEK(560)+PEEK(561)*256+4
25 POKE DL+5,2:POKE DL+6,2:POKE DL+8,2
:POKE DL+9,2
30 POKE DL+13,65:POKE DL+14,PEEK(560):
POKE DL+15,PEEK(561)
35 POSITION 6,3:? #6;"ScRaMbLe"
40 POKE 87,0:T=PEEK(88)+PEEK(89)*256
45 T=T+81:POKE 88,T-(INT(T/256)*256)
50 POKE 89,INT(T/256)
55 POKE 752,1:POSITION 11,1:? #6;"by
STEVE HUTTON"
60 T=T+101:POKE 88,T-(INT(T/256)*256)
65 POKE 89,INT(T/256):IF N<>0 THEN 75
70 POSITION 10,1:? #6;"INITIALIZING...
.":GOSUB 200
75 POSITION 6,1:? #6;"WANT INSTRUCTION
S?  (Y/N)"
80 P=PEEK(764):IF P=255 THEN 80
85 IF P=43 THEN 100
90 IF P=35 THEN 300
95 GOTO 80
100 GRAPHICS 0:POKE 16,64:POKE 53774,6
4:SETCOLOR 2,0,0:POKE 752,1
110 ? "               SCRAMBLE"
120 ? "               [M][M][M][M][M]
[M][M][M]"
130 ? :? " Scramble is a game of logic
 for one  person.";
140 ? " All that you have got to do is
rearrange the square so that the
LETTERS are in order."
150 ? :? " To do this,  you must press
 the keys which correspond with the Le
tters and Numbers that surround the";
160 ? " square."
170 ? :? "Press ESC to escape from the
 game."
180 ? "       [M][M][M]"
190 ? :? :? "    When you press the ST
ART KEY         The square will automa
tically                   SCRAMBLE"
195 IF PEEK(53279)<>6 THEN 195
196 GOTO 300
```

▶

```
200 RAMTOP=PEEK(106)-5:POKE 106,RAMTOP
:CS=RAMTOP+1
210 FOR I=0 TO 255:POKE CS*256+I,PEEK(
224*256+I):NEXT I
220 FOR I=0 TO 135:POKE (CS+1)*256+I,2
55-PEEK(225*256+I):NEXT I
230 FOR I=136 TO 255:POKE (CS+1)*256+I
,PEEK(225*256+(I-128)):NEXT I
240 FOR I=128 TO 135:POKE CS*256+I,PEE
K(225*256+(I-8)):NEXT I
250 FOR I=104 TO 111:READ A:POKE (CS+1
)*256+I,A:NEXT I:RETURN
260 DATA 255,189,153,129,165,189,189,2
55
300 GRAPHICS 2+16:POKE 16,64:POKE 5377
4,64:POKE 756,CS:N=0
310 SETCOLOR 0,1,12:SETCOLOR 1,8,4:SET
COLOR 2,12,6:SETCOLOR 3,3,6
320 A$="ABcd":B$="EFgh":C$="IJkl":D$="
MNop"
321 POSITION 6,3:? #6;"1"
322 POSITION 6,4:? #6;"2"
323 POSITION 6,5:? #6;"3"
324 POSITION 6,6:? #6;"4"
325 POSITION 13,3:? #6;"5"
326 POSITION 13,4:? #6;"6"
327 POSITION 13,5:? #6;"7"
328 POSITION 13,6:? #6;"8"
329 POSITION 8,1:? #6;"QRst":POSITION
8,8:? #6;"UVwx"
330 IF HI<99999 THEN POSITION 2,11:? #
6;HI;"  "
335 GOTO 500
340 POSITION 8,3:? #6;A$
350 POSITION 8,4:? #6;B$
360 POSITION 8,5:? #6;C$
370 POSITION 8,6:? #6;D$
380 Z$=STR$(INT(N)):POSITION 19-LEN(Z$
),11:? #6;INT(VAL(Z$)):RETURN
400 IF P=63 THEN D=1
401 IF P=21 THEN D=2
402 IF P=18 THEN D=3
403 IF P=58 THEN D=4
404 SOUND 0,160+(D*15),10,8
405 T$=A$(D,D):A$(D,D)=B$(D,D)
410 B$(D,D)=C$(D,D):C$(D,D)=D$(D,D)
420 D$(D,D)=T$:GOTO 340
430 IF P=42 THEN D=1
431 IF P=56 THEN D=2
432 IF P=61 THEN D=3
433 IF P=57 THEN D=4
434 SOUND 0,108+(D*15),10,8
435 T$=D$(D,D):D$(D,D)=C$(D,D)
440 C$(D,D)=B$(D,D):B$(D,D)=A$(D,D)
450 A$(D,D)=T$:GOTO 340
460 SOUND 0,108,10,8:T$=A$(1,1):A$(1)=
A$(2):A$(4,4)=T$:GOTO 340
461 SOUND 0,96,10,8:T$=B$(1,1):B$(1)=B
$(2):B$(4,4)=T$:GOTO 340
462 SOUND 0,91,10,8:T$=C$(1,1):C$(1)=C
$(2):C$(4,4)=T$:GOTO 340
463 SOUND 0,81,10,8:T$=D$(1,1):D$(1)=D
$(2):D$(4,4)=T$:GOTO 340
470 SOUND 0,72,10,8:T$=A$(4,4):A$(4,4)
=A$(3,3):A$(3,3)=A$(2,2):A$(2,2)=A$(1,
1):A$(1,1)=T$:GOTO 340
471 SOUND 0,64,10,8:T$=B$(4,4):B$(4,4)
=B$(3,3):B$(3,3)=B$(2,2):B$(2,2)=B$(1,
1):B$(1,1)=T$:GOTO 340
472 SOUND 0,60,10,8:T$=C$(4,4):C$(4,4)
=C$(3,3):C$(3,3)=C$(2,2):C$(2,2)=C$(1,
1):C$(1,1)=T$:GOTO 340
473 SOUND 0,53,10,8:T$=D$(4,4):D$(4,4)
=D$(3,3):D$(3,3)=D$(2,2):D$(2,2)=D$(1,
1):D$(1,1)=T$:GOTO 340
500 GOSUB 340
505 FOR I=1 TO 100:NEXT I
510 FOR I=0 TO 49:D=INT(RND(0)*4)+1:L=
INT(RND(0)*10)+1
520 ON L GOSUB 400,430,460,461,462,463
,470,471,472,473:SOUND 0,0,0,0:NEXT I:
POKE 764,255
530 P=PEEK(764):N=N+1:GOSUB 380:IF P=2
55 THEN 530
532 IF P=31 THEN GOSUB 460
533 IF P=30 THEN GOSUB 461
534 IF P=26 THEN GOSUB 462
535 IF P=24 THEN GOSUB 463
536 IF P=29 THEN GOSUB 470
537 IF P=27 THEN GOSUB 471
538 IF P=51 THEN GOSUB 472
539 IF P=53 THEN GOSUB 473
540 IF P=63 OR P=21 OR P=18 OR P=58 TH
EN GOSUB 400
541 IF P=42 OR P=56 OR P=61 OR P=57 TH
EN GOSUB 430
542 IF P=28 THEN GOTO 300
543 SOUND 0,0,0,0:POKE 764,255
544 IF A$="ABcd" AND B$="EFgh" AND C$=
"IJkl" AND D$="MNop" THEN GOTO 550
545 GOTO 530
550 FOR I=1 TO 6:FOR H=200 TO 150 STEP
 -1
555 SOUND 0,H,10,8:NEXT H:NEXT I
560 SOUND 0,0,0,0
570 IF N<HI THEN HI=INT(N):POSITION 2,
11:? #6;HI;"  "
580 IF PEEK(53279)<>6 THEN 580
585 POKE 764,255
590 GOTO 300
1000 RUN
```

■

CYTRON MASTERS

Dave Beech, Hull

CYTRON MASTERS 32K CASS.

STRATEGIC SIMULATIONS INC.

1/2 PLAYERS

. . . and now for something completely different. How many of you are becoming a bit jaded with arcade games and other run of the mill Atari software? For those who are, CYTRON MASTERS may well be the answer. It offers a good blend of strategy and arcade-type action that does not finish after a frantic, monster-blasting couple of minutes.

The game is produced by SSI who are renowned for their historically accurate war games and tactical space games. These are better left to dedicated war-gamers however as they require a good understanding of strategic movement and elements of war.

Originally written for the Apple computer, CYTRON MASTERS was to be a straightforward conversion for the Atari, however when the author, Dan Bunten, began the work, he was pleasantly surprised at how much better the Atari was against the Apple! In his own words—'not just a conversion, but a definite upgrade'.

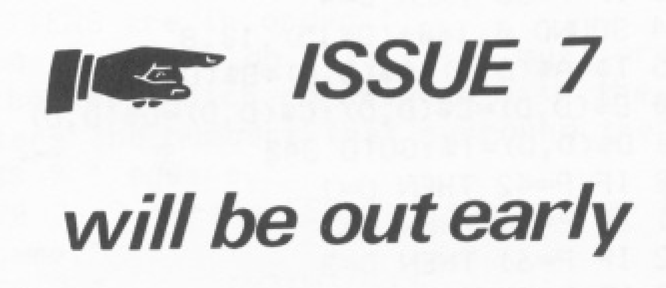
CYTRON MASTERS can be played by one player against the computer or by two players against each other. There are three difficulty levels—novice, master and grand master.

The object of the game is to destroy your opponent's command centre. To enable you to do this, you have at your disposal CYbernetic elecTRONic devices. These are mines, bunkers, shooters and commanders. Also available are missiles and anti-missiles. The action takes place on a battlefield of 38 by 18 spaces. Located in each half is the player's command centre and four power centres. Each Cytron is beamed down onto the battlefield from the command centre and once down begins advancing towards the enemy half. It will move three spaces on its own initially but will then wait for further orders to be moved left, right, back or forward. All commands are input via the joystick from menus displayed below the battlefield.

There are two ways to move your Cytrons—individually or as a group. The latter is by far the most effective. The number of Cytrons you can make is governed by the power you have available. This is shown on a gauge below the battlefield and itself is governed by how many power centres you have. Capture of your opponent's power centres is therefore very useful.

Shooter Cytrons automatically fire at any enemy unit within 3 spaces and each Cytron requires a varying number of hits before it is destroyed. Mine Cytrons explode on impact and are the only unit capable of destroying a command centre. Bunkers are mobile defensive units. To move a group of Cytrons needs the presence of a commander. Missiles should be used wisely as they use up the most power. Once launched they are directly controlled by the joystick and when detonated will destroy anything within 4 spaces. The only defence is an anti-missile.

This game is not a frenzy of colour and sound but contains some very neat graphics and effects like the scaled-down explosions and laser blasts. It also requires a bit more brain power than the average arcade game but nonetheless is very playable. I have not seen anything else quite like it for the Atari and in that respect it is unique. Definitely one of my top ten Atari games. As I said in the beginning . . .



Don't miss it—make sure you have renewed your subscription

Memories . . . contd.

PAGE. When talking about RAM, it means 256 bytes. 256*6=1536, the location of free RAM that you can write to for your own use (just like this magazine). Would you believe that's why they are both called PAGE 6? Page 6 RAM is for storing your own data. It is supposed to be a safe area but this is not 100% correct so be careful.

SHADOW LOCATION. Hardware registers are updated every screen cycle (every 50th of a second). If you were to POKE these registers directly the information would change after just one cycle. The answer is to write to a location which will store data and pass it to the Hardware register on every pass. This is called the SHADOW. 54273 is a hardware register and if you run the program above you will see it being updated. The FOR . . NEXT loop slows it down for your benefit.

If you study these locations and the locations given in your Basic Manual, then begin to experiment, you should end up with some pretty good programs. Remember, the professionals use these tricks of the trade. One final tip, if you RUN a program and you can BREAK it and LIST it, then do so and study the PEEKs and POKEs that are used. If the writer has used a form such as POKE HM,UO then just go to a free area on your screen and ask your computer to work it out, e.g. ? HM,UO and your ever friendly Atari will tell you what these variables are. POKE a new number into the location, RUN it again and see what happens. You can't damage the computer, at worst you may 'lock-up' and will have to switch off and on again but for this small price you may learn a lot. ●

Step Forward

Someone passed a cassette of three programs to me via Mike Reynolds-Jones of the Birmingham Atari Centre but I do not know who it was. Could the author please get in touch as I would like to put some of the programs in the magazine and wish to give proper credit. The programs are BEETLE, BLACKJACK and a PLAYER-MISSILE DEMO.

Editor.

THANK YOU!

As we complete our first year, I would like to thank all those people who have contributed to the magazine with articles, programs, help or encouragement. Thank you to:

Alan Oliver
Jeff Woodward
Stan Ockers
Colin Boswell
Geoff Brown
Phil Griffin
Mike Reynolds-Jones
Mike Aston
Colin Friston
W. H. Staff
Harvey Kong Tin
Michael Jackson
Paul Stevens
Steve Hutton
David Harry
Jamie Athas
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John Dimmer
Mark Hutchinson
Ken Woodward
John Massara
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L. A. Lawson
Ken Ward
Steve Gould
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of A.C.E., Oregon
Norman and Gail Denslow
of S.P.A.C.E., Pennsylvania
Dave Mentley
of ABACUS, California

It is always dangerous to name names for fear of offending those left out. My apologies to anyone omitted. Thanks also to all the readers and advertisers without whom . . .

Finally, how about a vote of thanks to the Editor—no, I can't really do that, that's up to you.

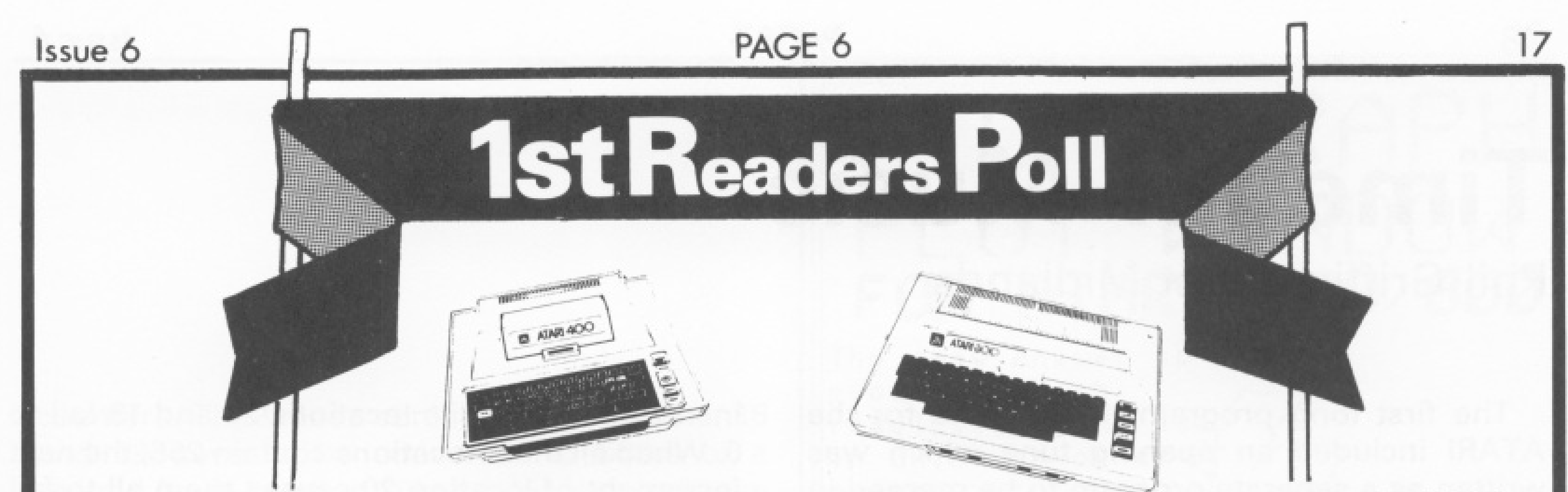
Les Ellingham

Times Tables..

Eddie Wilson

```
10 GRAPHICS 2:POSITION 0,3:? #6;"    times tables":FO
R M=1 TO 1500:NEXT M
15 A=INT(RND(0)*12)+1:B=INT(RND(0)*12)+1
20 GRAPHICS 2:POSITION 0,3:? #6;"      ";A;" * ";B;"=
";
30 INPUT C
35 IF A*B<>C THEN GOTO 47
39 IF A*B=C THEN GRAPHICS 2+16:FOR X=1 TO 12:? #6;"Yi
PpEe JuLiA gOt It":NEXT X
40 FOR T=1 TO 4:FOR S=1 TO 15:SETCOLOR 0,S,12/T
42 SOUND 0,200/S,10,10:SETCOLOR 4,16-S,T:SOUND 1,200/
T,10,10
43 NEXT S:NEXT T:SOUND 0,0,0,0:SOUND 1,0,0,0:GOTO 15
47 GRAPHICS 0:FOR I=1 TO 255 STEP 4:SOUND 0,I,8,10:FO
R W=1 TO 5:NEXT W:NEXT I
48 FOR T=1 TO 10:SETCOLOR 2,6,1:FOR D=1 TO 50:NEXT D:
SETCOLOR 2,6,7:FOR D=1 TO 50:NEXT D:NE
XT T:SOUND 0,0,0,0
50 GRAPHICS 1+16:SETCOLOR 2,4,6:SETCOLOR 1,0,0:RESTOR
E
51 FOR T=1 TO 23:? #6;"WRONG!!! TRY AGAIN"
60 FOR R=1 TO 5:SOUND 0,INT(RND(1)*256),10,10:NEXT R:
NEXT T:SOUND 0,0,0,0:GOTO 20
```

...For Julia



With this issue we complete our first year of publication and it is time for our first readers' poll. This is your chance to show your appreciation to all your fellow users who have contributed some fine articles and programs over the past six issues. We want to hear from as many of you as possible (including overseas readers), so that we know that you do read the magazine and so that the contributors can have some encouragement to keep on writing. Believe me, writing articles and programs for publication, especially as they are written for love and not money, can be pretty frustrating if you think no-one reads them. This is your chance to say thank you and give encouragement to the authors and spur them on to produce some more good work for forthcoming issues of PAGE 6.

To refresh your mind, these are the articles, programs and bits and pieces that you have to vote on. Do not worry if you did not read them all, just vote for the ones you did see.

Issue 1
- Secret Code
- Line Lister
- Adventure . . . America
- Vultures III
- More Graphics Modes
- Atari Attracts
- Software Reviews
- Banner
- First Steps

Issue 2
- Four in a Row
- Joysticks
- GTIA Modes
- Astro Chase—Review
- Silly Circles
- Play Your Cards
- GTIA Text Window
- Disk Directory
- Tiny Text
- Software Reviews
- First Steps

Issue 3
- Calendar
- Cricket Maths
- Arcade Action
- Character Redefinition
- Character Generation Utility
- Keyboard Techniques
- Character Designer
- Software Reviews
- Master Directory
- First Steps

Issue 4
- Lunar V
- Arcade Action
- Merlin's Magic Square
- Memory Mapped Screens
- Basic Timimg
- Grab an Apple
- Software Reviews
- Disk Sort
- First Steps

Issue 5
- What's Wrong with Fame?
- Target
- Memory Mapped Screens
- Across the Pond
- Squares
- Arcade Action—Miner 2049er
- Vertical P/M/Movement
- Software Reviews
- First Steps
- Colour Selector
- Line Lister

Issue 6
- Memories
- TeleCommunicate
- Scramble
- Cytron Masters
- Time for Music
- Bits & Pieces
- Dodger
- The Software Reviews
- Book Reviews
- Hypnosis
- Automatic Drive
- First Steps

WHAT TO DO. Pick out the **THREE** articles, programs or whatever that have given you the most pleasure, or which you have found most useful, and put them in 1-2-3 order on a plain sheet of paper. Add your name and address and send it off to PAGE 6. That's all there is to it. Do it as soon as you have finished reading this issue (articles from this issue are included in the poll).

The winner will receive £50 worth of software of their choice and we will sort something out for the runners-up. What is more important, everyone who receives a vote will be encouraged to try their hand at something else and that can only be to your benefit.

THE NEXT SIX ISSUES. What sort of articles and programs would you like to see? Add a couple of lines to your voting form so that we know which direction you would like the magazine to go.

We have thousands of readers — let's have thousands of votes

Time for Music

Phil Griffin, West Midlands

The first long program that I wrote for the ATARI included an opening tune which was written as a separate program to be merged in at the end. Everything went reasonably well with the main program and, at long last the great day came when I slotted in my 'musical masterpiece'. I eagerly ran the completed program and, horror of horrors, found that my original composition had ended up as something of a death march. It was quite easy to speed things up by reducing the length of the FOR . . . NEXT delay loop that I had used, but it set me wondering as to why the problem had arisen in the first place.

It appears that the longer a program gets, the longer it takes for a FOR . . . NEXT loop to be executed. The problem can be eased by placing the delay loop as a subroutine early on in the program but the resultant benefit is minimal. Programs which contain music normally store the 'notes' to be played in DATA statements and use the READ command to place the required values in the variables included in the SOUND statements. You will find that placing the DATA statements early on within the program will normally prevent any 'jerkiness' from the sound when the notes are changed.

Luckily, you don't have to rely wholly on FOR . . . NEXT loops for your timing requirements as the ATARI has an extremely versatile set of internal counters held in the Operating System at locations 18, 19 & 20. These counters are ideal where a precisely timed delay or routine is required. As with any Basic program however, the length of the program will still have an effect, but the timing provided by these locations will be constant and any slowing down will normally be negligible.

The three locations are inter-related and on power-up of the computer, the contents of each location is set to 0. Location 20 then starts to count until it reaches 255. On the next increment, location 20 falls to 0, while location 19 increases by 1. This sequence continues until both locations 20 and 19 contain 255. On the next increment of location 20, location 18 increases by 1 while locations 20 and 19 fall to 0. When all three locations contain 255, the next increment of location 20 causes them all to fall back to 0, so starting the whole cycle again. You can see from this that location 20 is the 'trigger' for location 19 which is in turn the 'trigger' for location 18.

The rate of increase of the value held in location 20 is related to the frequency of the mains electricity system. In America, the system is at 60Hz, while in Britain a frequency of 50Hz is used. This means that, in this country, after an initial reset to 0, a value of 50 would be held in location 20 after one second, a value of 100 after two seconds and so on. In America, the values held after the same intervals would be 60 and 120 respectively.

```
10 REM *     TIMER FOR ONE MINUTE     *
20 ? CHR$(125):POKE 752,1:REM CLEAR
         SCREEN AND SUPPRESS CURSOR
30 MINUTE=60*50:REM CONVERT 1 MINUTE
         TO 50ths OF A SECOND
40 A=256:B=A*A:REM THIS SPEEDS UP THE
         CALCULATION IN LINE 90
50 FOR I=1 TO 600:NEXT I:REM THESE ARE
         STILL USEFUL FOR DELAYS
60 POKE 18,0:POKE 19,0:POKE 20,0:REM -
         SET INTERNAL COUNTERS TO 0
70 ? CHR$(253):REM SOUND KEYBOARD
         BUZZER
80 ? "TIME STARTS NOW"
90 IF PEEK(18)+PEEK(19)*A+PEEK(20)<MIN
UTE THEN 90
100 ? CHR$(253):? "TIME UP!"
110 END
```

A timing in excess of 5 seconds or so will involve location 19 and possibly location 18. Probably the easiest way to time say, 1 minute, is to convert these locations to 1/50ths of a second (1/60ths in the U.S.A.) and compare the resultant figure with the one required. The Timer program shows how this could be done.

The program contains lots of REM statements which should make it easier to follow what is happening. Line 90 contains three PEEKs which read the contents of the

counters. The values contained in locations 18 and 19 have to be converted to 50ths of a second (as in location 20) and this is done in the program by multiplying the values by B and A respectively. The buzzer soundings and the delay are included in case you want to check the timing with a stopwatch. You will find that the routine's timing comes out at just over the minute, but don't forget that the program is written in Basic and there is bound to be an element of 'human error' in operating the stopwatch.

I have included a program containing the tune which started this all off in the first place and it now contains the improved delay routine. The main melody and harmony (voices 0 and 1) consist of a sequence of notes which remain the same throughout. The variation is produced by altering the accompanying 'chords' produced by voices 2 and 3.

```
5 REM *****         MUSIC          *****
6 REM **     by Phil Griffin         **
7 REM *****                        *****
8 REM
10 DATA 144,121,128,108,121,96,128,108
,144,121,96,72,121,96,128,108
20 DATA 91,72,96,81,108,91,121,96,128,
108,144,91,162,96,128,128
30 GOTO 7005
50 POKE 20,0
60 IF PEEK(20)<Z THEN 60
70 RETURN
7005 Z=10:FOR F=1 TO 5:GOTO 7030+F*10
7040 R=144:S=96:GOTO 7090
7050 R=153:GOTO 7090
7060 R=162:GOTO 7090
7070 R=173:S=108:GOTO 7090
7080 R=182:S=121
7090 SOUND 2,R,10,6:SOUND 3,S,10,6:FOR
 F1=1 TO 8:READ D,C:SOUND 0,D,10,14:SO
UND 1,C,10,6
7095 IF F=5 AND F1=1 THEN Z=2*Z
7100 GOSUB 50:IF F=5 AND F1=4 THEN SOU
ND 2,162,10,6:SOUND 3,108,10,6
7110 NEXT F1:IF F<4 THEN RESTORE 10
7120 NEXT F:SOUND 0,144,10,10:SOUND 1,
121,10,8:SOUND 2,72,10,6:SOUND 3,96,10
,6:Z=4*Z:GOSUB 50
7130 FOR J=0 TO 3:SOUND J,0,0,0:NEXT J
:END
```

Bits and Pieces

David Harry, West Midlands

Here are a few bits and pieces which I hope you will find useful or interesting.

BRIEF IS BEAUTIFUL—If you learned your Basic from the book that came with your Atari and all the listings you have typed in from magazines have been printed by the error-free method of LOADing the program into the computer and LISTing it straight out to the printer, then you are probably still using PRINT, LIST, INPUT, etc., in your own programming. Most of the Basic Keywords have abbreviations which can save you time and effort when writing your own programs or typing in listings. Type in the following demo exactly as shown, don't change a single space or character, and then RUN it.

```
10GR.23:C.1:PL.3,1:DR.150,70:F.X=1TO99
:SO.1,X,14,8:N.X:GR.0:POS.15,7:?"INPUT
 A";:I.A:?:?A:GOS.20:L.:T.30:G.999:.!
20SO.1,0,0,0:RET.
30? :? "BYE!
```

See what has happened? Your three lines have changed into five lines of program with only half the typing. Some points may not be immediately obvious. GR.23 is the same as GRAPHICS 7+16 and ? is the abbreviation for PRINT. In line 30 the Editor fills in the final quotation mark.

Line 10 shows a 50% saving in space, useful sometimes if you are trying to squeeze a lot of code into one FOR . . . NEXT loop or trying to PLOT and DRAWTO several points on one line. There is a snag with abbreviations. If the LISTed line exceeds three physical lines on the screen, you can't edit the line and if you want to change it, you will have to type it all again. Try changing line 10 when you have LISTed it.

Abbreviations can be overdone but they are well worth learning. All the abbreviations are shown in Appendix A of your manual.

FOUR IN A ROW—Four in A Row from Issue 2 is an excellent program, but when you wish to replay your opponent, you have to enter both names in all over again. The following changes will make this unnecessary

Renumber line 30 as 306 and line 50 as 307, then delete lines 30, 50 and 80. Change line 1540 to IF NAME$="Y" THEN 7000 and add the following:

```
7000 CT=0:? "WHO PLAYS FIRST?":? " 1)
";NAME1$;"?":? " 2) ";NAME2$;"?":? " 3
) NEW PLAYERS?","ENTER 1/2/3";
7010 TRAP 7000:INPUT GO:ON GO GOTO 300
,300,7020
7020 RUN
```

If you want the computer to play a stronger game then also change line 4400 to

```
4400 COLNO=INT(RND(1)*3)+INT(RND(1)*4)
+1
```

This biases its moves towards the more tactically valuable central columns.

TINY TIP—If you are writing a game for two players and wish to transfer the turn from one player to another, you could use

```
10 IF PLAYER=1 THEN PLAYER=2:GOTO 30
20 PLAYER=1
30 REM PLAYER NOW CHANGED
```

To save time and memory try using the following instead

```
10 PLAYER=3-PLAYER
20 REM PLAYER NOW CHANGED
```

This will work on all games which have two players.

Has anyone else got any little Hints and Tips?

David Harry

WHOOPS! ... ERROR 17

A couple of errors seem to have crept into the Line Lister on page 29 of Issue 4. The reference to 9999 in line 32500 should read 5000. Also after you type I=xxxx, you should type GOTO 32510 to resume the checking.

DODGER

Phil Griffin, West Midlands

You can't believe your eyes! Heading towards you is a huge army of giant red ants! They are moving much faster than you can run so the only thing to do is dodge out of their way. Best be nimble though for they will march faster and faster.

This simple game takes advantage of POKEs to the screen to move your character and the normal PRINT statement on the lowest line of the screen to achieve a 'scrolling' effect. The main playfield is in Antic mode 4 with the ants and your character redefined. This mode gives you the same number of characters as in Graphics 0 but has the advantage of colour giving much more impact. The movement is achieved by switching between two character sets which are moved into RAM and redefined in lines 5000 to 5090.

The game is played with a joystick in port 1 to move your character from side to side out of the way of the ants. There are three difficulty levels achieved by altering the speed of the 'scroll' in lines 200 and 205. You score one point for each 'scroll' you survive. You start with 10 lives. Good luck.

```
1 REM ******************************
2 REM *        <<DODGER>>          *
3 REM *            BY              *
4 REM *       PHIL GRIFFIN         *
5 REM * (extended by Les Ellingham) *
6 REM ******************************
9 REM ** INITIALISATION **
10 DIM A$(40),B$(40),STP(15):B$=" ":B$
(40)=B$:B$(2)=B$:HS=0:SC=1
12 FOR I=0 TO 15:READ A:STP(I)=A:NEXT
I
14 DATA 0,0,0,0,0,7,7,7,0,11,11,11,0,1
5,15,15
16 GOSUB 5000:GOTO 1600
19 REM ** START CHECK **
20 IF PEEK(53279)<>6 THEN RETURN
25 ? :? :?
30 POP :FOR J=1 TO 18:FOR I=250-10*J T
O 0 STEP -(11-J/2):SOUND 0,I,10,8:NEXT
 I:NEXT J:GOTO 1000
39 REM ** JOYSTICK ROUTINE **
40 B=A:S=STICK(0):IF S=11 THEN A=A-1:I
F A<CHK THEN A=CHK
50 IF S=7 THEN A=A+1:IF A>CHK+39 THEN
A=CHK+39
60 RETURN
69 REM ** CHECK FOR HIT **
70 IF PEEK(A)=5 THEN L=L-1:FOR J=1 TO
5:FOR I=0 TO 15:SOUND 0,16*I,8,10:SETC
OLOR 2,I,0:NEXT I:NEXT J:GOTO 90
80 RETURN
90 SOUND 0,0,0,0:POP :IF L=0 THEN 1500
95 IF SC>99 THEN X=5
100 GRAPHICS 2:POKE 752,1:SETCOLOR 2,0
,0:POSITION 4,1:? #6;"<< dodger >>":PO
SITION X,5:? #6;"score  ";SC
110 POSITION X,7:? #6;"lives  ";L:? :?
 "             LEVEL  ";LV:FOR J=1
TO 1000:NEXT J
120 SC=SC-8:POKE 77,0:GOTO 1010
150 REM ** ANT SOUNDS **
160 FOR S=1 TO 5:SOUND 0,100,12,4:NEXT
 S:SOUND 0,0,0,0:RETURN
170 FOR S=1 TO 5:SOUND 0,120,12,4:NEXT
 S:SOUND 0,0,0,0:RETURN
199 REM ** SELECTION OF A$ **
200 N1=INT(N*(N/SC)):IF N1>N THEN N1=N
205 FOR I=1 TO N1:NEXT I:GOTO 200+10*I
NT(RND(1)*8+1)
210 A$="   % %  %  % %    %    %
    %  %":RETURN
220 A$="   %    %   %    % %  %
 %   %  ":RETURN
230 A$=" %  %    %  % %  % % %
  %   %  ":RETURN
240 A$="% %  % %  %    %     %
%  %  % ":RETURN
250 A$=" %  %  %  % %    %   %
  %   % ":RETURN
260 A$=" %  %   %  %  % %   %  %
 %  % %  ":RETURN
270 A$=" %  %  %   %   % %  %   %
  %      ":RETURN
280 A$="%      % %    %  % %  %  %
%  %  %  %":RETURN
999 REM ** MAIN GAME ROUTINE **
1000 SC=1:L=10:X=6
1010 GRAPHICS 0:POKE 559,0:GOSUB 2000:
SETCOLOR 2,0,12:SETCOLOR 0,3,2:SETCOLO
R 1,0,12
1015 POKE 752,1:SETCOLOR 4,12,8:TL=PEE
K(88)+PEEK(89)*256:POKE 82,0:POKE 559,
34
1020 A=TL+179:CHK=TL+160:? :FOR J=1 TO
 5:? B$:NEXT J:POKE 756,CS1/256:POKE A
,15
1030 GOSUB 40:POKE B,0:GOSUB 70:POKE 7
56,CS1/256:POKE A,STP(STICK(0)):GOSUB
200
1031 GOSUB 40:POKE B,0:? A$:GOSUB 160:
GOSUB 70:POKE A,STP(STICK(0)):SC=SC+1
```

```
1035 GOSUB 40:POKE B,0:GOSUB 70:POKE 7
56,CS2/256:POKE A,STP(STICK(0)):GOSUB
200
1036 GOSUB 40:POKE B,0:? A$:GOSUB 170:
GOSUB 70:POKE A,STP(STICK(0)):SC=SC+1:
GOTO 1030
1499 REM ** GAME OVER **
1500 IF SC>HS THEN HS=SC
1510 GRAPHICS 18:POSITION 5,1:? #6;"ga
me  over":POSITION 4,4:? #6;"SCORE
";SC
1520 POSITION 4,6:? #6;"HI-SCORE ";HS:
DL=PEEK(560)+PEEK(561)*256:POKE DL+15,
6:POKE DL+16,6
1525 FOR J=25 TO 0 STEP -0.5:FOR I=0 T
O 250-10*J STEP 26-J:SOUND 0,I,14,8:NE
XT I:NEXT J:SOUND 0,0,0,0
1530 POSITION 2,10:? #6;"press- start
for":POSITION 4,11:? #6;"another game"
:POKE 53279,8
1540 IF PEEK(53279)<>6 THEN 1540
1599 REM ** OPENING CREDITS **
1600 GRAPHICS 1:SETCOLOR 2,0,0:POKE 82
,0:POKE 752,1:POKE 756,CS1/256:DL=PEEK
(560)+PEEK(561)*256:POKE DL+3,71
1605 POKE DL+25,68:POKE DL+28,4:POKE D
L+29,4:POKE DL+30,4
1610 POSITION 4,0:? #6;"<< dodger >>":
POSITION 9,2:? #6;"BY":POSITION 0,4:?
#6;"     P.A.GRIFFIN "
1620 POSITION 7,6:? #6;"------":POSITI
ON 0,8:? #6;"for difficulty level":POS
ITION 3,9:? #6;"press- select "
1630 POSITION 3,12:? #6;"1 (EASY)":POS
ITION 3,13:? #6;"2 (MODERATE)":POSITIO
N 3,14:? #6;"3 (HARD)"
1640 POSITION 0,17:? #6;"press- start
to play":TL=PEEK(88)+PEEK(89)*256:N=20
1649 REM ** OPTION ROUTINE **
1650 POKE TL+296,0:POKE TL+256,74:N1=7
5:GOSUB 205:? A$:N=75:LV=1:POKE 53279,
8
1660 IF PEEK(53279)<>5 THEN GOSUB 20:G
OTO 1650
1665 FOR I=1 TO 15:SOUND 0,255,10,10:N
EXT I:SOUND 0,0,0,0
1670 POKE TL+256,0:POKE TL+276,74:N1=3
5:GOSUB 205:? A$:N=35:LV=2:POKE 53279,
8
1680 IF PEEK(53279)<>5 THEN GOSUB 20:G
OTO 1670
1685 FOR I=1 TO 15:SOUND 0,255,10,10:N
EXT I:SOUND 0,0,0,0
1690 POKE TL+276,0:POKE TL+296,74:N1=1
:GOSUB 205:? A$:N=1:LV=3:POKE 53279,8
1700 IF PEEK(53279)<>5 THEN GOSUB 20:G
OTO 1690
1705 FOR I=1 TO 15:SOUND 0,255,10,10:N
EXT I:SOUND 0,0,0,0
1710 GOTO 1650
1999 REM CHANGE SCREEN TO ANTIC 4
2000 DL=PEEK(560)+256*PEEK(561):GRAPHI
CS 0
2010 POKE DL+3,68
2020 FOR I=DL+6 TO DL+28:POKE I,4:NEXT
I
2030 RETURN
4999 REM MOVE CHARACTER SET AND CHANGE
 CHARACTERS
5000 POKE 106,PEEK(106)-11:GRAPHICS 0
5010 CS1=(PEEK(106)+3)*256
5020 CS2=(PEEK(106)+7)*256
5025 DIM Z$(32):FOR I=1 TO 32:READ Z:Z
$(I)=CHR$(Z):NEXT I:A=USR(ADR(Z$),5734
4,CS1):A=USR(ADR(Z$),57344,CS2)
5030 DATA 104,104,133,204,104,133,203,
104,133,206,104,133,205,162,4
5035 DATA 160,0,177,203,145,205,136,20
8,249,230,204,230,206,202,208,240,96
5040 READ X:IF X=-1 THEN 5080
5050 FOR Y=0 TO 7:READ Z:POKE CS1+X*8+
Y,Z:POKE CS2+X*8+Y,Z:NEXT Y:GOTO 5040
5060 DATA 5,65,65,105,20,85,20,85,65
5062 DATA 15,255,60,60,195,255,28,255,
195
5064 DATA 11,255,60,60,192,252,28,252,
204
5066 DATA 7,255,60,60,3,63,28,63,51
5068 DATA -1
5080 FOR Y=0 TO 7:READ Z:POKE CS2+5*8+
Y,Z:NEXT Y:RETURN
5090 DATA 0,65,105,20,20,20,85,65
```

■

THE SOFTWARE REVIEWS

KRAZY KOPTER 1 PLAYER 16K CASS.

FIREFLEET 1 PLAYER 32K CASS.

DIAMONDS 1/2 PLAYERS 16K CASS.

ENGLISH SOFTWARE CO.

Since the famous Airstrike, English Software Company have not been idle. These 3 latest releases are the first of a whole gamut of new titles lined up for release very shortly.

KRAZY KOPTER is well-titled, it is a crazy game. If you like getting blown up and losing all your reserve helicopters within the space of one minute, this game is for you. It is a one player game and, if you have not already guessed it, you play the part of the helicopter.

There are 3 levels, level 1 consisting of a barrage of Navy missiles, level 2 has anti-aircraft rockets and level 3 has zig-zagging UFO's. The screen display is of three bridges which span a river and two sheer canyon sides. Collision with either of these loses a life. When the game begins, a ship sails across the river and a selection of trucks and cars cross the bridges in a random order. If so much as ONE car gets from one side of the bridge to the other, a rocket comes shooting onto the screen and destroys your helicopter. There is no way you can avoid this, as your helicopter's movement is frozen. To destroy a car, you position the 'copter above the car you want to obliterate and press the fire button on joystick 1. This releases a bomb, but you must be fast, and I mean FAST!

To sum up, if you let a car cross the bridge from left to right or vice-versa, you lose a life. To progress to the next level, you must destroy 75 cars!!! Definitely one only for masochists.

Of the three games DIAMONDS is the best and it has the added bonus of a competition to win a REAL diamond!

The game consists of 16 levels with 4 screens to each level, giving a total of 64 screens! To reach the Great White Diamond—the object of the game and the competition—you must reach screen 64. As far as comparisons go, this game is another digging game very similar to Dig-Dug, however in September's Computer & Video Games, Diamonds was voted the best of three digging games, including Dig-Dug. At £14.95, it represents excellent value for money with sound and graphics on a par with American software. The characters you have to contend with are Phillip The Filler, The Fireflies, The Eyes and Simon The Snake. You play the part of Digger Dan and, as in Dig-Dug, you move Dan through the layers of earth collecting the pockets of diamonds which are randomly distributed. There are rocks which you can burrow under which will then drop on your enemies if they are in hot pursuit, or on you if you are not quick enough!

While you are burrowing away like mad, Brian the Blob is also after the diamonds. If you encounter Brian or any of the previously mentioned 'nasties' or another creature called The Demon, you lose a life. You start with 3 lives and don't get a bonus life at all. You can pause the game by pressing the joystick button.

In conclusion, an excellent game which goes to prove that there are some English programmers who will give those Americans a run for their money!

Whereas the other games can be enjoyed by anyone with an Atari 400/800, you will need an upgrade to run FIREFLEET as it is 32K.

FIREFLEET is basically the English answer to Caverns of Mars but the way everything explodes is quite original. If you hit anything with your bombs, a column of horizontal lines comes shooting up. The ship itself could be taken straight out of Caverns.

The game is for one player with a joystick and the object is to navigate through 34 vertically scrolling screens divided into 4 equal sectors. A free ship is awarded every 10,000 points, unlike Caverns of Mars where you don't get any.

Taking into consideration that this game is half the price of Caverns, it represents very good value for money with excellent vertical scrolling. Although the graphics are superb, the

Reviewed by STEVE GOULD

sound effects could do with some improvement, especially when the ship gets hit or collides with a wall. The effect is somewhat flat. If the sound effects were better and the ship exploded when hit, this would be a top class game but it still represents very good value for money and is a must for your collection.

DONKEY KONG 16K ROM

ATARI

1/2 PLAYERS

Arcade fanatics will be quite familiar with this one and have been waiting some time for it to appear. For the uninitiated, the game consists of 4 screens of entirely different action, the object being to reach the top of a network of ladders, ramps, elevators, conveyor belts, etc., in order to reach a platform where 'Kong' is holding your girl-friend hostage. You play the part of Mario the Carpenter—complete with bib and brace overalls, cap and moustache—and to be re-united with your lost girl-friend, you must negotiate all the levels of action which start with the ramps on level 1. Kong is on the right hand side of the screen and is rolling or throwing barrels down at you. Don't worry, provided that you are alert, you can jump barrels coming down the ramp by pressing the trigger which causes Mario to leap into the air and, hopefully, avoid the obstacle. When you reach the top of the ramps and ladders, Kong steals your prize from under your nose and runs off to the top of the next screen while you have to start over at the bottom. So the chase goes on.

Having seen and played the original arcade game, I was most eager to see how the Atari ROM version compared. Atari bought the rights from Nintendo and I was hoping therefore that their version would be identical but sadly I was disappointed. There is no opening sequence where Kong climbs up the ladders and jumps to the left of the screen thus destroying the orderly nature of the ramps. The music and sound effects are entirely different and also the order of the screens is different. For the seasoned player, the order is: 1 Ramps, 2 Rivets, 3 Ramps, 4 Elevators, 5 Rivets, 6 Ramps, 7 Pies, 8 Elevators. As you can see, there is quite an array to get through before you can rescue your betrothed.

Although the game is disappointing when compared with the original, the graphics and sound are very good indeed and after seeing versions of Kong on other machines, the Atari version is the best (if you disregard the price), and that includes the well-publicised Coleco version!

Ever wondered why this has such a crazy title? Well, the game originated in Japan and DON-KAI in Japanese means 'Crazy'. Does it make more sense now?

FOOTNOTE TO KRAZY KOPTER. English Software have now changed the program so that you can avoid the killer rocket and the game is much more playable. If you were unlucky enough to buy the first version of the game, English Software will exchange it for you.

PHARAOH'S CURSE 32K DISK

SYNAPSE 32K CASS.

1 PLAYER

Yet another instant hit from the Synapse people. The theme of the game is influenced by the latest arcade craze. You have seen the Space Invader clones and the Pacman clones, now it's the turn of Donkey Kong. It seems that, just lately, if a game features ladders and elevators it has a good chance of success.

Pharaoh's Curse has the lot—lifts, mummies, pharaohs, jumping, man-traps and 16 treasures to collect. There are 4 skill levels with the first level being level 0! To access the other 3 levels, you must complete the previous one to find a password that will enable you to proceed. To start level 0, you simply press the joystick button.

At the start of the 'mission', the character you control, a sort of Indiana Jones, is standing outside the pyramid. On entering, you are immediately dropped into one of 15 rooms, each of which contains a treasure. How come only 15 rooms but 16 treasures? You are ▶

Typo Tables

MENU

Variable checksum = 1202971

Line num range	Code	Length
100 - 190	HZ	525
200 - 300	MG	506
310 - 420	TY	577
430 - 540	GC	383
550 - 660	VU	569
670 - 760	JC	530
770 - 880	PD	377
890 - 995	WM	394
1000 - 1110	PU	478
1120 - 1170	QW	460

AUTORUN.SYS PAGE 30

Variable checksum = 79085

Line num range	Code	Length
10 - 170	WH	343
180 - 370	NF	363

DODGER

Variable checksum = 312350

Line num range	Code	Length
1 - 19	ZF	477
20 - 90	CE	552
95 - 170	XJ	521
199 - 280	ZS	550
999 - 1031	OR	562
1035 - 1525	NC	570
1530 - 1610	ZQ	534
1620 - 1650	UZ	504
1660 - 1690	RT	500
1700 - 5020	AU	461
5025 - 5080	CG	541
5090 - 5090	IW	29

BINARY REPRESENTATION

Variable checksum = 115964

Line num range	Code	Length
0 - 15	DS	509
20 - 130	UV	475
140 - 170	JL	59

SCRAMBLE

Variable checksum = 235821

Line num range	Code	Length
1 - 25	DQ	575
30 - 75	QS	533
80 - 150	VC	516
160 - 230	QJ	510
240 - 323	IY	512
324 - 370	BQ	456
380 - 432	HH	387
433 - 462	GQ	516
463 - 471	NF	543
472 - 510	EC	557
520 - 541	GS	515
542 - 1000	IK	399

FULL DETAILS OF TYPO APPEAR IN ISSUE 5

[redacted]

generously 'given' a treasure as soon as you enter the door! Across the top of the screen there are 16 'blobs', each of which represents a treasure and which disappear when you collect each treasure. You can always see how many you have left to collect. In the various rooms there are glowing keys which, when touched, disappear. The character then begins to flash, to show that you are in possession of a key, and you can then unlock the numerous secret doors. You will need a key to get out once you have collected all the treasures as the exit is through a secret door.

To make things harder, there is a Mummy and a Pharaoh who chase you and shoot at you but you can return the fire although it is not as easy as it sounds. Also wandering around the pyramid is the 'Winged Avenger' who can, if you happen to be in the wrong place at the wrong time, carry you away to another location in the complex. Sometimes this can be an advantage, but most of the time—well, the less said, the better. On the helpful side, you do get a bonus life every time you collect a treasure.

Graphics and sound are up to the usual Synapse standard and if you like 'jumping' games, this one is highly recommended.

GRIDRUNNER 16K CASS.

LLAMASOFT

1/2 PLAYERS

With the average price of Atari software in the £20-£30 area, it is very pleasing to hear of a 100% machine code game for the Atari 400/800 which costs less than £10. In fact this costs only £7.50. With a certain amount of misgiving, I sent off my cheque, expecting nothing more than a glorified magazine listing, but was very pleasantly surprised when I loaded the game. Delivery, by the way, was approximately one week.

After being assured that 'the power of the grid was going to preserve me' I pressed start to be confronted by a fast and furious game. The closest comparison I can think of is Centipede, but instead of centipedes and spiders, the player is presented with an all-out onslaught from X-Y zappers, pods, droids and other alien devices. The graphics are not the clearest I have seen and at times the action gets quite confusing but the sound effects are extremely good. The ship's entrance onto the grid is most original and seems rather like coming out of hyperspace in Defender. Game play is very fast to say the least and it would be advisable for the would-be Gridrunner to develop two more pairs of eyes and an extra pair of hands!

Many people stay away from cheap Atari software for fear of being ripped off but Gridrunner is well worth the money and sets a good standard for Atari Software at a reasonable price.

CAVERNS 16K CASS.

TITAN PROGRAMS

1 PLAYER

If Gridrunner typifies good value for money, then this game shows why I am always wary of cheap software. If you believe the adverts, you would expect something similar to Scramble or Caverns of Mars. What you get couldn't be further away.

All of the action takes place on one screen and the game itself is a two-part BASIC program. The overall quality is that of a poor magazine listing. The spaceship consists of three dots and the caverns are formed by filling in the left hand side of the screen and then randomly PLOTing and DRAWingTO in the background colour. You just have to reach the right hand side of the screen and get back past several 'gates'. The only good part about the game is the sound effects which I must admit are rather original.

This might be worth a try at £3.00 but is not worth its £6.00 price. Above all, as a commercial program, it is an insult to the Atari's capabilities. Take a look at A.C.E., MAGIC WINDOW or GRIDRUNNER if you want value for money in low priced software. ●

Book Reviews

Ken Ward, Norwich

MAKING THE MOST OF YOUR ATARI
by Paul Bunn
Interface Publications £8.95

The first thing that struck me about this book was the appalling waste. At least 20% of the book is blank paper! Mr. Bunn is very presumptious when in Chapter One he says that he will teach you your machine inside out and a little bit extra! He also says "the book is aimed at the computer user who has had his Atari computer for one or two months". He then takes several pages of the next chapter to teach you how to use the commands—GRAPHICS, SETCOLOR, COLOR, PLOT & DRAWTO which are explained in your manual. Presumably Atari owners are only supposed to know how to play Star Raiders! LOCATE is very briefly mentioned, as are the file commands. GTIA modes are covered with demo's and the GR.10 demo is worth the effort of typing in all that data. The display list and display list interrupts are described—badly. There is, however, a useful error reporting routine that can be loaded when typing in your own programs or listings. It saves you diving for the reference manual to find out what Error xx is.

Chapter 6 gives a lengthy description of Player-Missile graphics (lengthy for this book anyway). This is followed by the shortest article on redefining characters I've seen. Chapter 9 takes six pages to tell you about Joysticks and Paddles. It's all in the reference manual anyway.

Finally we come to the games, which range from a couple of games that date back to the early days of personal computing, through to versions of some of the popular games of today. Some of the listings have silly errors but they won't stop the games running and can be ignored, except for the last one which is the best game in the book. (Actually, it's Frog Jump—a version of Frogger—not Dodge 'Em as stated on the back cover.) The game is full of data statements, and not a RESTORE anywhere!

Considering it is supposed to be an instructional book there is a great lack of REM statements in the listings. Most of the games are nicely finished off, and some contain good routines. Overall my impression is it's a hastily prepared book and it's only value is in the games.

GAMES FOR THE ATARI
by S. Roberts
Hofacker £4.95

This book starts on page zero with a list of the graphic and sound commands, and on pages 1 and 2 gives a quick demo of PLOT and DRAWTO. It then jumps straight into Player-Missiles, taking you through step by step, then giving you a demo program to put your little man on the screen, and some POKE's to try to change his position, size and colour. This is followed by a demo of horizontal movement and priority.

The next section uses a demo to illustrate the problem of vertical movement in Basic, before giving you a machine language program to do the same thing. The P/M section of the book then ends with demo's and explanations on alternating shapes, missiles and collision detection.

Sound is covered by short demo's, as is reading the joystick, then it's on to the games. Not a really great selection. Two of them are based on the Mastermind game—one with numbers and letters, the other with colours. The latter is the first game I've seen that uses GR.11. Many of the games can do with tidying up graphically, which is a good way to learn. This section ends with a game for anyone that has an Assembler.

Next it's back to the learning with articles and demo's on Antic, DLI's, CTIA/GTIA and character redefining. All these articles could have been very good were it not for the printing and English errors (the book is actually produced in Germany). The reader is also confused by the constant cross referencing of DEC/HEX numbering. To a beginner it is all too

continued on page 29

HYPNOSIS

Steve Eales, Essex

This short demo program introduces 'page flipping', a technique that is fairly easy to do on the Atari. A number of images are drawn in different parts of memory and by manipulating two bytes in the Display List, you can switch instantly to another display. The technique can be used for a number of purposes but is most often used for animation. An article on page flipping will be featured shortly in PAGE 6.

```
1 REM **********HYPNOSIS************
2 REM *            BY              *
3 REM ********STEVE EALES***********
4 REM
10 L=0:A=PEEK(106)
20 DIM DL(13),DH(13)
30 X=5:Y=0:X1=75:Y1=39
100 FOR J=1 TO 13
110 POKE 106,A-L
120 GRAPHICS 20
130 COLOR 1:PLOT X,Y:DRAWTO X1,Y:DRAWT
O X1,Y1:DRAWTO X,Y1:DRAWTO X,Y
140 DL(J)=PEEK(560):DH(J)=PEEK(561)
150 L=L+4:X=X+3:Y=Y+3:X1=X1-3:Y1=Y1-3
160 NEXT J
200 FOR J=1 TO 13
210 GOSUB 300
220 NEXT J
230 FOR J=13 TO 1 STEP -1
235 GOSUB 300
240 NEXT J
250 GOTO 200
300 POKE 560,DL(J):POKE 561,DH(J)
310 FOR W=1 TO 25:NEXT W
320 RETURN
```

■

Listing Conventions

As far as possible, the listings will be 38 characters wide to allow you to match up to the screen, but where control characters are explained in a line this will not be possible.

Three types of characters are difficult to reproduce in a listing—Inverse, Control and Inverse Control.

INVERSE—all characters to be typed in inverse are underlined.

CONTROL—characters which require the CTRL key to be pressed are shown in square brackets [ ]. Press CTRL and the key shown in the bracket. Characters which require the ESC key to be pressed first will show ESC,CTRL followed by a word or words to describe the key to be pressed. You may have to refer to your Basic Reference Manual if you do not understand some of the keys.

INVERSE CONTROL—characters will be shown in pointed brackets <>. Follow the instructions for control characters but press the Atari key first.

The listings should be typed as accurately as possible and MUST be typed exactly if TYPO is used to check them.

All programs featured in PAGE 6 will run in 16K unless otherwise stated.

Book Reviews contd.

jumbled to make a lot of sense, and needs an understanding of HEX numbers and machine language to make sense, which is a shame, because the book starts off so well.

ATARI SOUND AND GRAPHICS
by Moore, Lower & Albrecht
Wiley £6.75

From the same stable as Atari Basic, this book follows the same format—teaching everything in the slowest possible way, ending each chapter with tests.

I was in middle-age when, completely ignorant of everything computing, I placed hands on a computer for the first time. The Atari Basic book annoyed me, this one annoyed me even more.

The Graphic side of the book is basic to the point of being silly. It doesn't get past PLOT & DRAWTO! The bulk of the book is taken up by Sound creation, taking you from the simple beep through to complicated tunes. There are some useful pieces on Attack and Decay, and Phase Shift, giving some idea of how to get quite advanced sounds even from Basic. But it is not enough to raise this book out of the mire. ●

Automatic Drive

Les Ellingham

When you boot-up a commercial disk, it normally goes straight to a title sequence to give you something to look at while the main program loads. You might consider that the programming that goes into the boot-up process too complicated to attempt but you can in fact create your own AUTORUN.SYS file quite easily which is a program that causes the computer to automatically boot-up a program of your choice.

Let's look first at what happens when you boot-up DOS. When you switch on the computer, it is pre-programmed to run through an initialisation process which sets various parameters to enable proper operation of the system. One of the things it tries to do is load the Disk Operating System into memory, providing of course a disk drive is connected and is switched on. If it is successful in loading DOS, one of the next steps in the initialisation is to search the disk used for a file named AUTORUN.SYS and then load bytes from that file into memory culminating with some bytes loaded into addresses $2E0 and $2E1 (736,737). These bytes will give the starting address of the routine contained in the AUTORUN.SYS file. Normally control is passed to Basic, if a Basic Cartridge is present, otherwise to DOS, but you can specify any address in these locations and control will automatically pass to that address. If the address is that of the routine in your AUTORUN.SYS file, then your instructions will be automatically executed. It's as simple as that.

So, all you have to do is write a short Basic program, name it AUTORUN.SYS and put it on your disk? Unfortunately it is not as simple as that, for the AUTORUN.SYS file must be a binary file to be loaded. All is not lost however for those of you who do not understand machine language, for Listing 1 is a Basic program which will create a binary AUTORUN.SYS file for you.

Once you have typed in the program, insert a disk into your drive with DOS.SYS on it and RUN the program. You will be asked for the command you wish to have executed when the disk is booted. Just type RUN"D:MENU" or RUN 'whatever you wish' and press return. The AUTORUN.SYS file will be written on the disk in drive 1 and the next time you boot-up using this disk, the program you have chosen will RUN automatically (provided of course it is on the disk!).

So, what can you use it for? Well, you can have a disk with just one program on it and RUN that program, or a title screen that will then RUN another program, but the most common use is to RUN a Menu which allows you to look through several programs on a disk and RUN the one of your choice by pressing just one key. There are several Menu programs around but most of these use Graphics 0 and some have trouble in squeezing several programs onto the screen. The Menu program presented with this article, uses Graphics 2 for a very pleasing display and is one of the best Menu programs I have seen. It is rather long for a simple Menu, but if you type it in, you will not be disappointed and can upgrade your disks to "automatic drive".

```
10 DIM A$(50)
20 ? CHR$(125):? "BASIC COMMAND TO ISSUE ":? :INPUT A$
30 L=61+LEN(A$)-1
40 OPEN #1,8,0,"D:AUTORUN.SYS"
50 FOR I=1 TO 4:READ A:PUT #1,A:NEXT I
60 PUT #1,L:PUT #1,6
120 FOR I=1 TO 61
130 READ D
140 IF I=12 THEN PUT #1,LEN(A$):GOTO 160
150 PUT #1,D
160 NEXT I
170 FOR I=LEN(A$) TO 1 STEP -1
180 PUT #1,ASC(A$(I,I)).
190 NEXT I
200 FOR I=1 TO 6:READ C:PUT #1,C:NEXT I
260 CLOSE #1:END
290 DATA 255,255,0,6
300 DATA 169,18,141,33,3,169,6,141,34,3
310 DATA 169,10,141,128,6,76,105,243,251,243
320 DATA 51,246,33,6,163,246,51,246,60,246
330 DATA 76,228,248,0,172,128,6,240,9,185
340 DATA 60,6,206,128,6,160,1,96,140,33
350 DATA 3,169,228,141,34,3,169,155,160,1,96
370 DATA 252,1,254,1,255,5
```

One final tip. If you make the first line of each program on the disk POKE 580,1, the Menu will be booted-up each time you press System Reset. ▶

```
100 REM ********** MENU ************
110 GOTO 970
120 FOR ME=Q1 TO LEN(B$):IF B$(ME,ME)=
" " THEN JW$(ME,ME)=" ":GOTO 140
130 JW=ASC(B$(ME,ME))+128:JW$(ME,ME)=C
HR$(JW)
140 NEXT ME:RETURN
150 POKE 16,64:POKE 53774,112:POKE 710
,14:POKE 708,31:POKE 709,172:POKE 711,
90:POKE 712,144:RETURN
160 TRAP 170:INPUT #Q1,P$:IF P$(5,Q8)<
>"FREE" THEN 260
170 POSITION Q2,Q6:? #Q6;" TOTAL FILES
=":POSITION Q2,Q8:? #Q6;P$(Q1,Q4);"FRE
E SECTORS":? #Q6;L$:IF BP>Q6 THEN DBP=
Q6:TBP=BP
180 IF BP<=Q6 THEN DBP=BP:TBP=BP
190 BPD$="CONTINUEBASIC   DOS     ":JW
$="CONTINUEBASIC   DOS     ":SEL=Q1:PN
=Q3:GOSUB 120
200 POSITION Q6,Q1:? #Q6;"M E N U":POS
ITION Q7,Q7:? #Q6;"               "
210 POKE 540,60:POKE Q279,Q3
220 IF PEEK(Q279)=Q6 THEN RETURN
230 IF PEEK(540)>25 THEN POSITION Q4,Q
7:? #Q6;"press start":GOTO 220
240 POSITION Q4,Q7:? #Q6;"            "
:IF PEEK(540)=Q3 THEN 210
250 GOTO 220
260 R=R+Q1:POSITION 15,Q6:? #Q6;R:D$(R
*17-16,R*17)=P$:IF P$(11,11)=" " THEN
BP=BP+Q1:B$(BP*Q8-7,BP*Q8)=P$(Q7,10)
270 GOTO 160
280 KEY=PEEK(764):POKE 764,255:TEMP=LS
EL:LSEL=SEL:KEYSEL=Q1:IF KEY=31 THEN S
EL=Q1:GOTO 650
290 IF KEY=30 THEN SEL=Q2:GOTO 660
300 IF KEY=26 THEN SEL=Q7:GOTO 670
310 IF KEY=24 THEN SEL=Q4:GOTO 380
320 IF KEY=29 THEN SEL=5:GOTO 380
330 IF KEY=27 THEN SEL=Q6:GOTO 380
340 IF KEY=51 THEN SEL=7:GOTO 380
350 IF KEY=53 THEN SEL=Q8:GOTO 380
360 IF KEY=48 THEN SEL=9:GOTO 380
370 LSEL=TEMP:GOTO 590
380 TRAP 40000:KEYSEL=Q1:FP=PN-DBP:CP=
SEL-Q7+FP:GOTO 750
390 GRAPHICS 17:GOSUB 150:? #Q6:? #Q6;
"   SELECT OPTION":? #Q6;"     PRESS ST
ART":RETURN
400 GRAPHICS 18:GOSUB 150:OP=100:? #Q6
;L$:GOSUB 410:GOTO 440
410 POSITION Q4,Q2:? #Q6;"select optio
n":POSITION 5,Q4:? #Q6;"PRESS START":?
 #Q6;L$:POSITION Q3,10:? #Q6;L$
420 POSITION Q2,7:? #Q6;"RUN BASIC PRO
GRAM":POSITION Q2,9:? #Q6;"display dir
ectory":RETURN
430 POSITION Q2,7:? #Q6;"run basic pro
gram":POSITION Q2,9:? #Q6;"DISPLAY DIR
ECTORY":RETURN
440 BUT=PEEK(Q279):IF BUT=5 OR BUT=Q7
THEN GOSUB 1050:GOTO 500
450 IF BUT=Q6 THEN GOSUB Q20:GOTO 470
460 GOTO 440
470 BUT=PEEK(Q279):IF BUT=Q6 THEN 470
480 GOSUB Q20:IF OP=100 THEN GOSUB 390
:GOTO 520
490 GOTO 850
500 IF OP=100 THEN OP=200:GOSUB 430:GO
TO 440
510 OP=100:GOSUB 420:GOTO 440
520 IF BP=Q3 THEN 1140
530 IF BP>Q6 THEN DBP=Q6:TBP=BP
540 IF BP<=Q6 THEN DBP=BP:TBP=BP
550 SC=INT(BP/Q6)+Q1:SEL=Q1:PN=Q3
560 S=PEEK(560)+PEEK(561)*256+Q4:SM=PE
EK(S)+PEEK(S+Q1)*256:JW=USR(ADR(MC$),S
M+60,360)
570 FOR DIS=Q1 TO Q7:POSITION Q4,DIS*Q
2+Q2:? #Q6;DIS;"= ";BPD$(DIS*Q8-7,DIS*
Q8):NEXT DIS:POSITION Q4,Q4:? #Q6;"1="
580 FOR DIS=Q4 TO DBP+Q7:PN=PN+Q1:POSI
TION Q4,DIS*Q2+Q2:? #Q6;DIS;"= ";B$(PN
*Q8-7,PN*Q8):NEXT DIS
590 BUT=PEEK(Q279):IF BUT=Q6 THEN GOSU
B Q20:GOTO 740
600 IF PEEK(764)<>255 THEN 280
610 IF BUT=Q7 OR BUT=5 THEN 630
620 KEYSEL=Q3:GOTO 590
630 LSEL=SEL:SEL=SEL+Q1:IF SEL=DBP+Q4
THEN SEL=Q1
640 IF SEL>Q7 THEN 710
650 IF SEL=Q1 THEN POSITION Q4,Q4:? #Q
6;"1= CONTINUE":POSITION Q4,Q6:? #Q6;"
2= BASIC":POSITION Q4,Q8:? #Q6;"3= DOS
"
660 IF SEL=Q2 THEN POSITION Q4,Q4:? #Q
6;"1= CONTINUE":POSITION Q4,Q6:? #Q6;"
2= BASIC":POSITION Q4,Q8:? #Q6;"3= DOS
"
670 IF SEL=Q7 THEN POSITION Q4,Q4:? #Q
6;"1= CONTINUE":POSITION Q4,Q6:? #Q6;"
2= BASIC":POSITION Q4,Q8:? #Q6;"3= DOS
"
680 IF KEYSEL THEN 800
690 IF SEL=Q1 THEN FP=PN-DBP:LP=LSEL-Q
7+FP:CP=SEL-Q7+FP:GOTO 720
700 GOSUB 1080:GOTO 590
710 FP=PN-DBP:LP=LSEL-Q7+FP:CP=SEL-Q7+
FP:IF SEL=Q4 THEN POSITION Q4,Q8:? #Q6
;"3= DOS":ISEL=52+128:GOTO 730
720 POSITION Q4,LSEL*Q2+Q2:? #Q6;LSEL;
"= ";B$(LP*Q8-7,LP*Q8):ISEL=LSEL+49+12
8:IF SEL=Q1 THEN GOSUB 1080:GOTO 590
730 POSITION Q4,SEL*Q2+Q2:? #Q6;CHR$(I
SEL);"= ";JW$(CP*Q8-7,CP*Q8):GOSUB 108
0:GOTO 590
740 BUT=PEEK(Q279):IF BUT=Q6 THEN 740
750 IF SEL<Q4 THEN GOSUB Q20:GOTO 800
760 DOIT$="D1:":TRAP 1160:DOIT$(LEN(DO
IT$)+Q1)=B$(CP*Q8-7,CP*Q8):GRAPHICS 18
:GOSUB 150
770 POSITION Q6,Q7:? #Q6;"LOADING":FOR
 LD=Q1 TO LEN(DOIT$):IF DOIT$(LD,LD)="
 " THEN POP :GOTO 790
780 NEXT LD
790 XX=10-INT(LD/Q2):POSITION XX,5:? #
Q6;DOIT$:RUN DOIT$
800 IF SEL=Q2 THEN END
810 IF SEL=Q7 THEN DOS
820 TBP=TBP-Q6:IF TBP<=Q3 THEN GOTO 52
0
830 IF TBP>=Q6 THEN DBP=Q6:GOTO 560
840 DBP=TBP:GOTO 560
850 TRAP 940:GOSUB 1130:PR=R:SP=Q3:SC=
Q3
860 IF PR=Q3 THEN 940
870 SC=SC+Q1:IF SC<10 THEN PR=PR-Q1:SP
=SP+Q1:? #Q6:? #Q6;D$(SP*17-16,SP*17):
GOTO 860
880 IF SC=Q3 AND PR=Q3 THEN 940
890 POSITION Q4,22:? #Q6;"PRESS START"
900 IF PEEK(Q279)<>Q6 THEN 900
910 GOSUB Q20
920 IF PEEK(Q279)=Q6 THEN 920
930 GOSUB Q20:SC=Q1:GOSUB 1130:GOTO 86
0
940 POSITION Q4,22:? #Q6;"PRESS START"
950 IF PEEK(Q279)<>Q6 THEN 950
960 GOSUB Q20:GOTO 1030
970 READ Q1,Q2,Q3,Q4,Q6,Q7,Q8,Q20,Q279
980 DATA 1,2,0,4,6,3,8,1110,53279
990 DIM D$(1088),P$(20),OP$(20),L$(20)
,BPD$(24),JW$(512),B$(512),DOIT$(11),M
C$(42)
995 L$="____________________":REM INVE
RSE SHIFT MINUS
1000 MC$="hh<E>Lh<E>Kh<E>Nh<E>M&N
[,]}[,]<Q>K<H>P<;>fLJ0[F]Pt$MPpF
L [,]<Q>K[.]":GRAPHICS 18:GOSUB 150:
CLOSE #Q1:OPEN #Q1,Q6,Q3,"D:*.*":? #Q6
;L$
1010 POSITION Q6,Q1:? #Q6;"M E N U":PO
SITION Q7,Q7:? #Q6;" YOUR  TITLE  ":?
#Q6;L$:POKE 580,Q3:POKE 65,Q1
1020 POSITION Q2,Q6:? #Q6;"READING FIL
E";:GOSUB 160:GOSUB Q20
1030 IF PEEK(Q279)=Q6 THEN 1030
1040 GOSUB Q20:GOTO 400
1050 GOSUB Q20
```

The Autorun program has appeared in several U.S. user group newsletters, but the author is not specified. The Menu program comes from a disk of Public Domain programs from A.B.A.C.U.S. of California and again the author is not shown.

GOTO 33

FIRST STEPS

Mark Hutchinson, Belfast

(Following the threatened disappearance of First Steps last month we now have an offer from Mark Hutchinson to write the column but he needs some reader response. It's up to you.)

It is a wonderful sensation when you rip open the wrapping paper to reveal your ATARI computer. You cannot wait to plug into the mains, turn on your TV and get stuck in. Then comes the big problem—'What do I do next?' Well, to be honest, just play about first and get to know the layout of the keyboard. Don't be afraid of doing any damage—you can't. If something peculiar happens just switch off and start again. When your little heart has stopped pounding, sit down with the manual and a cuppa and soak up a little knowledge. You really need to learn the basics before you start anything intricate. Let us suppose you have had your computer for about a week and you are now looking for some help. If you decide to purchase ANALOG or a similar magazine, you will find them good but perhaps a little over your head at this stage. The solution is to send an immediate subscription to PAGE 6 and look out each issue for FIRST STEPS. I hope in this column to write articles to aid beginners to computing and the ATARI, based on my own frustrations from three years ago when I purchased my 400 and could find no help.

Where can I start with this column? Probably by getting some reader response sent either to the Editor or to myself. I will not publish your letters, so do not feel embarrassed about asking questions you feel are too silly to print. You may see you questions in print, but not your name. I will even answer enquiries sent directly to me, but you will need to enclose a stamped addressed envelope. Do not worry if it seems ages for an answer, I am honour-bound to reply to an s.a.e.

Now that the preamble is over, let's find something to say for this month.

ECONOMIES—REAL OR FALSE?

If you insist on saving more than one program per tape, then the best way is to save just one program on each side. If you want more than this, then try to get a tape with a short leader and zero the tape counter at the start of the tape and make your first CSAVE. At the end of the first program leave a good gap, say twenty digits, and note the counter setting, then save your next program. Always, but always, keep a backup. Use a thick non-chrome tape to avoid stretching and always release the play button to avoid kinks in the tape. Keep your tape heads scrupulously clean but use only a cleaner designed for the job, never use anything abrasive. If you cannot find the start of a program at a later date, play the tape on your stereo. When a constant whistle starts, that is the start of the program. Economy is easy with a 410 and a cheap C90 tape but when you start getting load problems . . .

A disk drive gives greater flexibility and speed. For common routines or unimportant programs you can economise by using both sides of a single sided disk. Unlike many other inferior machines, the ATARI does not need the timing hole, it writes its own timing marks during format. All you need to do is to carefully cut out a write notch on the other side of the disk. I recommend that you format both sides at the same time as I would not trust the print through resistance of some disks unless guaranteed double sided. Again, always keep backup copies and always write protect your completed disks.

In general, buy yourself a good store for your recording media and keep everything away from dust, dirt, direct sunlight, dirty fingers, magnetic fields and harsh temperatures. Buy dust covers for your machines and peripherals, you will find the expense well worth it in the long run. I keep all my manuals and magazines in four-hole plastic envelopes in a ring binder and after some three years they are as good as new.

That's it for my first column. Let me know what sort of things you want to know, and look out for some answers to those problems in forthcoming issues.

Write to Mark at BAUG Software, P.O. Box 123, Belfast, N. Ireland BT10 0DB.

Menu Program continued

```
1060 BUT=PEEK(Q279):IF BUT=5 OR BUT=Q7
 THEN 1060
1070 RETURN
1080 POKE 540,20
1090 S=PEEK(540):IF S<>Q3 THEN SOUND Q
3,SEL-Q1,Q2,S/Q2:GOTO 1090
1100 SOUND Q3,Q3,Q3,Q3:RETURN
1110 SOUND Q3,102,12,Q8:SOUND Q1,51,12
,Q8:POKE Q279,Q3:SOUND Q2,Q3,Q2,Q8:SOU
ND Q7,Q1,Q2,Q8:POKE Q279,Q3
1120 FOR S=Q3 TO Q7:SOUND S,Q3,Q3,Q3:N
EXT S:RETURN
1130 GRAPHICS 17:GOSUB 150:? #Q6:? #Q6
;"  FILE    EXT SEC":SC=Q3:RETURN
1140 GRAPHICS Q3:? :? "  THIS PROGRAM
REQUIRES THAT BASIC":? :? "  PROGRAMS
HAVE NO FILE EXTENTIONS."
1150 ? :? "  NO BASIC PROGRAMS WERE FO
UND ON":? :? "  THIS DISKETTE.":? :END
1160 GRAPHICS 18:GOSUB 150:? #Q6:? #Q6
:? #Q6;"    I WAS UNABLE":? #Q6:? #Q6;
"      TO LOAD ":? #Q6:? #Q6;"     ";DO
IT$
1170 FOR JW=100 TO 255:SOUND Q3,JW,10,
Q8:SOUND Q1,JW-Q2,10,Q8:NEXT JW:SOUND
Q3,Q3,Q3,Q3:SOUND Q1,Q3,Q3,Q3:TRAP 400
00:GOTO 400
```

This page is put aside each issue for the exclusive use of Birmingham User Group

Bug Club Call

A. G. M.

The A.G.M. of Birmingham User Group, an Independent Atari Computer Club, will be on Thursday, 24th November, 1983, at 8 p.m., at The Matador, Bull Ring, Birmingham City Centre.

Nominations are called for the following posts: Chairman, Vice-Chairman, Secretary, Treasurer and SIX ordinary committee members. Nominations shall be signed by two ordinary members of the Club and endorsed by the nominee. They must be received by the Honorary Secretary BEFORE 17th November, 1983.

Proposals for amendments to the Club Rules must be signed by TWO ordinary members and submitted to the Honorary Secretary BEFORE 31st October, 1983.

PLEASE ATTEND

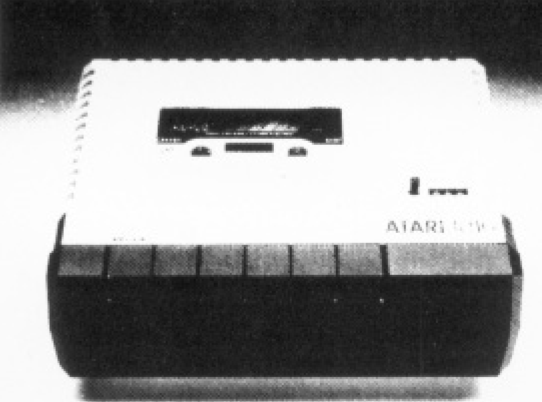
▶ For those who did not go, we actually arranged a coach trip down to London for the Personal Computer World Show on 2nd October. The show was one of the few to have quite a lot of interest for Atari folks and the people who went on the trip had a great time but there were spare seats on the coach. We have over 180 members and couldn't get 52 to go on a trip to the best computer show in the U.K. even with the promise of Atari's new range on show and at a cost barely more than the admission price. Those who went had a good time, but where were the rest of you?

▶ We now have a magnificent notice Board for YOU to use. You can use it to swap public domain programs, find others with similar interests, start self-help groups or sell hardware but we do ask that you do not use it to sell software. Why? Because, as a Club, we are wary of piracy. Facilities exist to sell your software, have a word with Steve Gould.

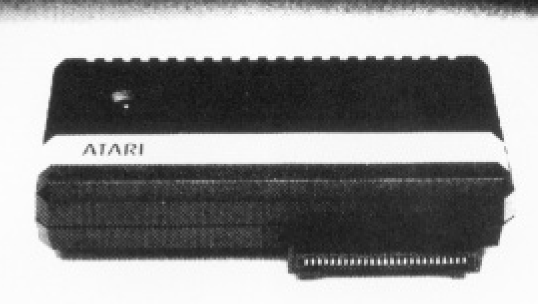
Talking of piracy, did you know that Atari employ a full-time private investigator in the States, known to the community at large as Mad Dog! Once he sniffs you out he won't let go! Over here we are more civilised and hopefully Atari won't need to spend their money (thus keeping up prices) on private eyes. Or will they? One or two members have been seen with long lists of software for 'trade' and some have brought copies of commercial programs to the Club on blank disks. Let's repeat our position—it's in the constitution—**BUG will not tolerate piracy in any form** and we ask members not to put themselves in a position to risk expulsion from the Club. Do you know why Atari won't let User Groups have software for demonstration? They are worried about pirating. BUG, as a Club, does not support piracy and the committee asks each and every member to use their common sense and help stamp it out.

▶ CHRISTMAS!

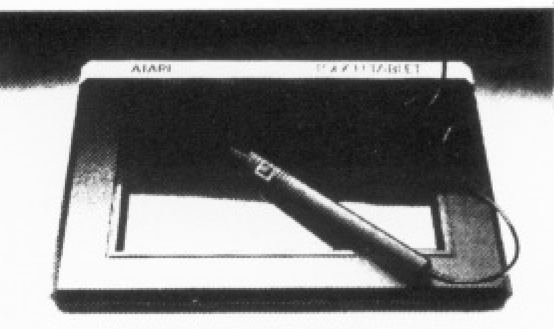
▶ PARTY TIME. This will be the last magazine before our last meeting of the year and as Christmas time is party time, we hereby announce our Grand Christmas Party to be held on 7th December. Prizes, competitions, etc., but let's have some help from you. Put forward your ideas and offer some assistance. Meanwhile, here is a competition for the night. A grand prize to the writer of the best program of a Christmas Carol for the Atari. Get writing.



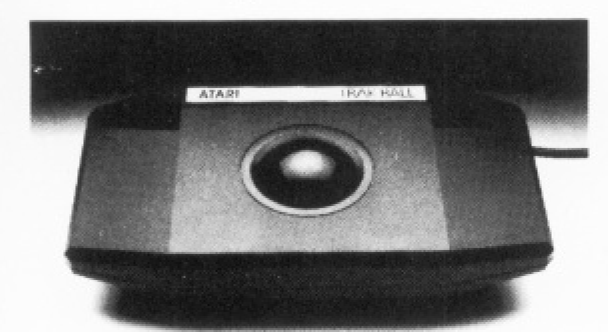
1. Program Recorder.



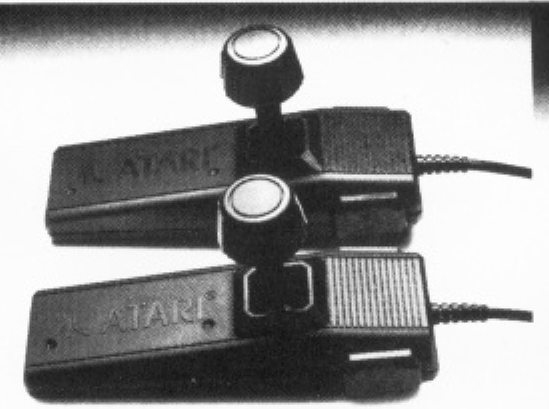
2. 64K Memory Module.



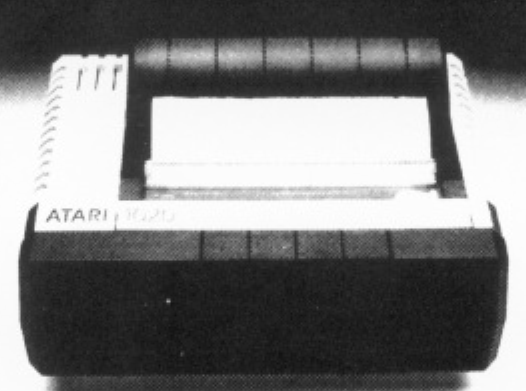
3. Touch Tablet.



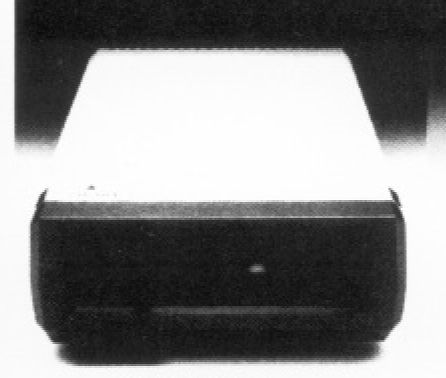
4. Trak Ball™ Controller.



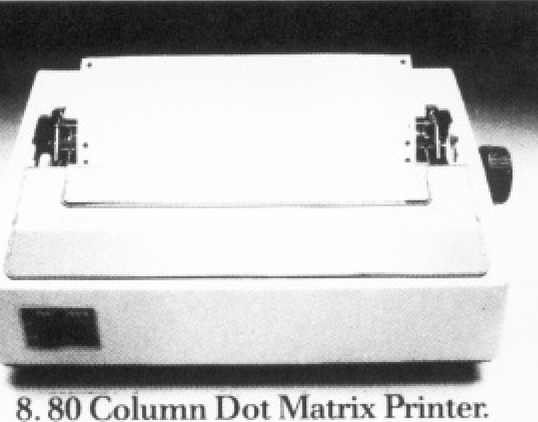
5. Super Joysticks.



6. Colour Printer.



7. Disk Drive.



8. 80 Column Dot Matrix Printer.



9. Letter Quality Printer.

These peripherals will be available soon:

1. ATARI 1010™ Program Recorder for low cost storage and retrieval capability. Data transmission 600 baud. Storage capability 100K bytes on a 60 minute cassette. Track configuration 4 track, 2 channels (digital and audio). Auto record/playback/pause control.

2. ATARI 64K Memory Module gives the 600XL a massive 64K RAM.

3. ATARI Touch Tablet enables you to paint pictures and draw diagrams, with the touch of a stylus.

4. ATARI Trak Ball™ Controller enables cursor movement in any direction; adds to the pleasure of Atari games.

5. ATARI Super Joysticks. Gives you a greater competitive edge over your games.

6. ATARI 1020™ Colour Printer plotter. Four colour graphic print capability. 40 column. 10 characters per second. 5, 10 and 20 characters per inch.

7. ATARI 1050™ Dual Density Disk Drive. 5¼ inch disks holding 127K randomly accessible bytes provides both expansion and flexibility for your 600XL system with DOS III.

8. ATARI 1025™ 80 Column Dot Matrix Printer prints 5, 10 or 16.5 characters per inch. 40 characters per second. Ideal for program listings, financial reports, etc.

9. ATARI 1027™ Letter Quality Printer for word processing letters in professional type.

If you'd like to know more about the ATARI 600XL, write to Atari International (UK) Inc., P.O. Box 407, Blackhorse Road, London SE8 5JH and we'll send you all the details.

The new Atari XL home computer system. ATARI®

®ATARI and design. Reg. U.S. Pat and TM Off. TM: Trademark of Atari Inc. The ATARI 600XL is compatible with ATARI 400 and 800 programs.

FOR ALL INFORMATION ON NEW ATARI PRODUCTS CALL-WRITE OR PHONE

Home Entertainment

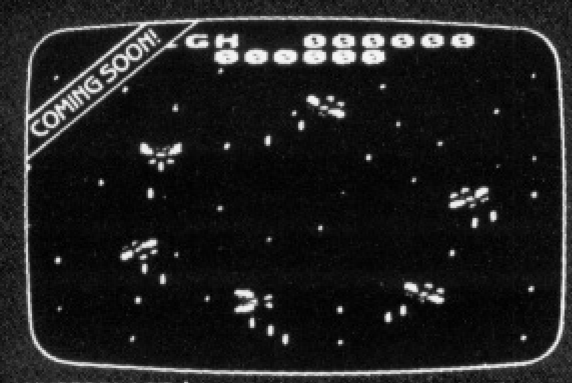


ATARI® CENTER

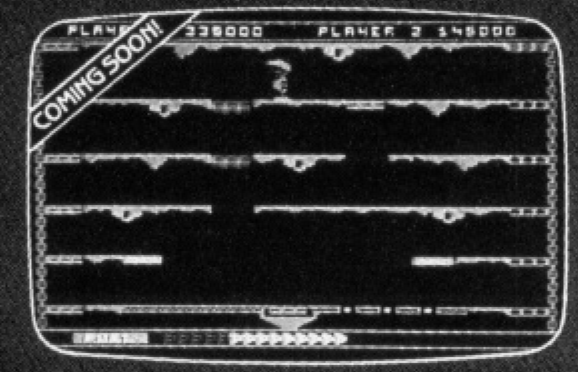
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HYPERBLAST 16K by John Brierley
Simply the best arcade-action game ever written in 16K! Defend your Atari against 10 waves of the most awesome creatures ever to inhabit your TV screen!



JET BOOT JACK 16K by Jon Williams
You are our intrepid hero, jetting along infested caverns, climbing moving elevators and more...much more! Ten screens to conquer, you'll need the will to survive.



VENUS VOYAGER 2 16K by Christopher Daniel
Multiple screen lander simulation – choose your sites, avoid all the hazards and rescue your stranded comrades.

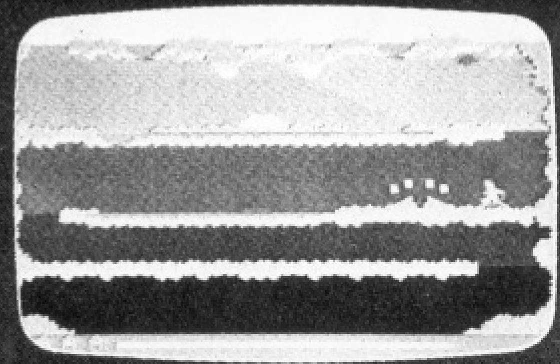


XENON RAID 32K by John Brierley
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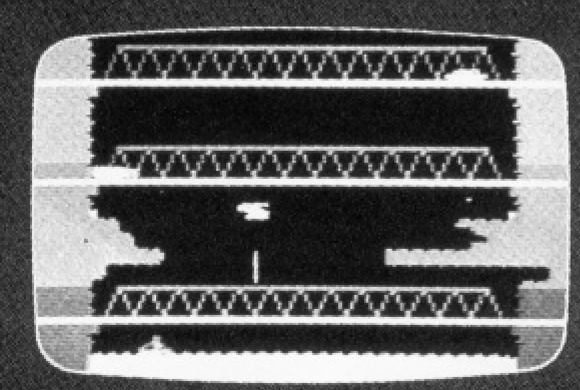


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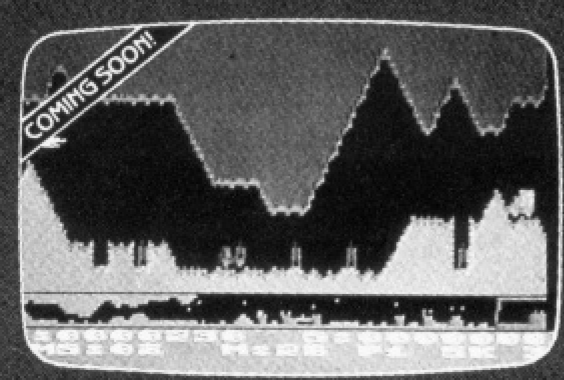
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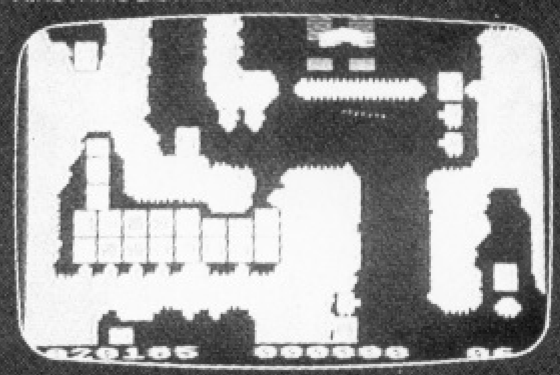
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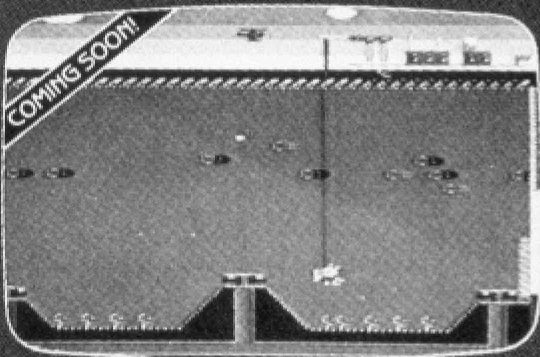
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